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A syllabus outlining the subjects of the examination and the requirements for registration, together with an application form and a list of recommended text and reference books and other publications, may be obtained by addressing Dr. J. T. Phair, Secretary of the Committee on the Certification of Sanitary Inspectors. Copies of the 1935 and 1936 examination papers are also available if desired.

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Tuberculosis and the Medical Officer of Health*

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I THINK no person will disagree when I say that, considering the facilities which are available to physicians and public health departments, tuberculosis is not being controlled as rapidly as might fairly be expected. It is well worth while to remind ourselves of our resources in combating this disease. The physician graduating to-day has had training in diagnosis, treatment, and prevention. Through the service of travelling diagnostic chest clinics as maintained by the Provincial Department of Health, assistance is given to the general practitioner in confirming the diagnosis, particularly in early cases. The facilities of x-ray examination are provided and the services of expert diagnosticians are freely given. Existing sanatoria have been enlarged and new institutions erected to serve various parts of the whole province. Treatment facilities in the sanatoria are thoroughly modern, making provision for lung surgery which promises to be of increasing assistance in the treatment of certain cases. The role of the public health nurse, in those communities which are fortunate in possessing such nurses, in finding the contacts of cases, in giving instruction in the home, and in every way increasing the knowledge of the general public in regard to the control of this disease, is recognized by all health officers.

It is gratifying indeed that in the period from 1900 to 1935 the mortality rate from tuberculosis, all forms, has fallen two-thirds. It is right that we should take credit for much of this great saving of lives. It must be remembered, however, that such factors as the improved standard of living and improved

**Abstract of presidential address delivered at the Twenty-second Annual Meeting of the Ontario Health Officers' Association, Toronto, May, 1936.*

sanitation have played a highly important part in this reduction. We as physicians and medical officers cannot properly claim the full credit for this great achievement.

The extent of the reduction in tuberculosis mortality is presented in table I. If the tuberculosis mortality rate of 1900, namely 160 per 100,000 population, is applied to the province to-day, the number of tuberculosis deaths would be 5,754, as compared with the actual number recorded for the year 1935, namely 1,300.

It is interesting to note the redistribution of the ten chief causes of death in the years 1900 and 1935, as presented in table II. In 1900 tuberculosis

TABLE I

TUBERCULOSIS (ALL FORMS), ONTARIO, 1900-1935

Year	Deaths	Rates per 100,000	Year	Deaths	Rates per 100,000
1900	3,484	160.1	1920	2,280	78.8
1905	2,667	114.9	1925	1,842	59.4
1910	2,291	91.9	1930	1,791	54.1
1915	2,466	91.7	1935	1,301	36.2

TABLE II

THE CHIEF CAUSES OF DEATH

Ontario, 1900 and 1935
Rates per 100,000

1900		1935	
Tuberculosis	160	Heart disease	196
Senility	147	Cancer	117
Pneumonia and influenza	128	Disease of arteries	114
Congenital malformation, prematurity and debility	107	Pneumonia and influenza	94
Diarrhoea and enteritis	98	Accidents	63
Cerebral haemorrhage	87	Nephritis	51
Heart disease	65	Congenital malformation, debility, premature birth	50
Measles, whooping cough, scarlet fever, diphtheria	56	Tuberculosis	36
Accidents	52	Cerebral haemorrhage	29
Cancer	47	Diabetes	14

occupied first place in the list of causes of death; in 1935 it is in eighth place. Yet it occupies the first place as a cause of death in the young adult group of from 20 to 35 years and is second only to external causes in adolescents and in the group 35 to 39 years. Thus in the period of greatest earning power and greatest family dependence tuberculosis is still the second cause of death.

After surveying the excellent progress which has been made in reducing the toll of tuberculosis, Dr. W. J. Dobbie, in an address to this association last year, stated (1):

"One need not in any way seem to minimize or depreciate these admirable results and achievements when one ventures to suggest that something more is now required if further progress is to be made in reducing the mortality, morbidity, and infection rates from this disease."

In my opinion Dr. Dobbie referred particularly to morbidity rather than to mortality. We are lessening the mortality rate of tuberculosis very materially. We are saving the lives of many who a few years ago would surely have died, but can we say that our present labours have lessened the incidence to the same degree that we have reduced the mortality? Certainly not. It may well be said that we are not using as completely and efficiently as we should the means and equipment now placed at our disposal. The reasons for our failure both as physicians and medical officers need to be analyzed. It may be that the practising physician fails in his duty because of a lack of appreciation of the modern conception of tuberculosis control. He may excuse himself for not reporting a case of tuberculosis to the medical officer of health because he has found that the medical officer has shown no interest and does not take any action or assist in meeting the problems presented. Too often when active cases are diagnosed by either the practitioner or the travelling clinic no immediate action is taken to isolate the cases from other members of the family, particularly children, thus defeating the benefit of early diagnosis and continuing the spread of the disease. When sanatorium or hospital treatment is indicated, the medical health officer should be able to assist the physician in arranging accommodation and in obtaining the approval of the municipal officers to pay the share of the maintenance charges which must be met by the municipality for those patients who are unable to pay for treatment.

It is essential that every medical officer of health should have a system of record-keeping which will supply immediately information as to the known cases of tuberculosis and contacts, as well as cases in sanatoria and patients discharged from such institutions. The confidence of physicians in the department will be greatly strengthened by the health officer's maintaining such records.

In any consideration of this subject the importance of the home in our fight to control tuberculosis must be carefully considered. Should patients be treated at home? I believe that generally the home is the last place for the treatment of a patient with active tuberculosis. When the patient is able to leave the sanatorium, the disease having ceased to be active, home care is essential. Those caring for the patient must be educated in matters relating to the disease and the home must be generally prepared to receive the patient.

The main provision, in my opinion, for the adequate control of tuberculosis is free sanatorium treatment for every tuberculosis patient. With such provision and adequate accommodation patients could be admitted promptly, receiving proper treatment, and the spread of infection from such cases to others in the home and workshop would be prevented. At present they are allowed to remain too long at home, infecting other members of the family, before action is taken. Is this not the cause of our present continuing incidence of tuberculosis? It may be said that to provide immediate sanatorium accommodation for every active case of tuberculosis would cost too much or could not be financed. True, the cost would be large for the first years but a decline in incidence due to the effectiveness of the control would result in a continuously reduced number of sanatorium patients.

It is well to remind ourselves of that part of the cost of tuberculosis for which definite figures are available. This is presented in table III.

The amount expended by the Provincial Treasury and the municipalities for the care of tuberculous patients in general hospitals cannot be ascertained accurately but must represent a very considerable expenditure. Further, the cost of maintenance of patients at home cannot be estimated, nor the financial loss arising indirectly out of loss of earning power in the community.

The provision of free sanatorium treatment for all cases has already been proved of tremendous assistance in controlling tuberculosis in the province of Saskatchewan. Realizing that every case comes from another case and that segregation of the tuberculous sick in a sanatorium and their education regarding the prevention of the spread of the disease are essential, the Government of Saskatchewan made provision in 1929 for the care of all patients without charge to the individual. Dr. R. G. Ferguson, Director of Medical Services

TABLE III

COST OF TUBERCULOSIS IN ONTARIO, 1934

Financial assistance given by the Government to sanatoria (75 cents per patient per day)	$ 738,397.54
Paid by municipalities for the maintenance of patients in sanatoria ($1.50 per patient per day)	1,293,719.09
Tuberculosis was responsible for placing on the list of the Mothers' Allowance Commission 980 families or 13.3 per cent of the total allowance	400,000.00
Total cost to the Provincial Treasury and the municipalities	$2,432,116.63
Paid by patients towards their own maintenance	293,130.16
Total cost of tuberculosis	$2,725,246.79

and General Superintendent of the tuberculosis control program, pointed out in a recent article (2) some of the results obtained. Physicians, knowing that patients will be treated without cost, discovered 445 new cases in 1933 in their routine practice and without assistance. In 1928, prior to free treatment, 14.3 per cent of the patients were discovered in the incipient stage, and in 1933 25.4 per cent. Since the introduction of free sanatorium treatment there has been a reduction of 25 per cent in the tuberculosis death rate. There has also been a reduction in the number of new active cases discovered from 1,143 in 1931 to 879 in 1933. This reduction in no way indicates a lessened activity in searching for new cases through physicians and clinics. Already there is an indication that the present number of sanatorium beds will be adequate for the needs of the province. It is interesting to record that similar action is being considered by the province of Alberta.

The importance of contact needs no emphasis. We recognize its menace in the home where an open case exists but we do not appreciate its danger among such groups as pupil nurses in hospitals, to fellow workers in shops, or from the teacher to her pupils. Tuberculosis among nurses in training is a serious problem. The steps which have been taken by the Provincial Department of Health, requiring adequate examination of pupil nurses, school teachers, and groups in different institutions to discover incipient tuberculosis are most commendable. Such diagnosis can be made only with the aid of x-ray examina-

tion of the chest. It is startling that in Saskatchewan in 1933 5 per cent of all patients under treatment in sanatoria were nurses or nurses-in-training. The incidence of breakdown of nurses in training during 1933 was 12.7 per thousand or twelve times the incidence of tuberculosis morbidity among the general population.

The battle against tuberculosis is still going on the world over and the enemy still challenges mankind. We must concentrate our forces more than ever before in a determined effort to lessen the number of contacts by immediate isolation of every known case of tuberculosis and making every effort through the medical officer, the attending physician, and the travelling clinic, to have these cases diagnosed as early as possible and placed under treatment promptly.

It is agreed that if tuberculosis is to be further controlled and the incidence reduced, the following are essential:

1. Each case of tuberculosis must be traced to its source.
2. Each case must be properly treated.
3. Each source of infection must be isolated by one method or another.
4. All contacts must be investigated.
5. All contacts who have been infected must be safeguarded.

Giving due consideration to all the present measures which have been demonstrated by experience to be of value, one can only conclude that not only have we failed to utilize the facilities to the full extent but we have not placed sufficient stress upon the separation of the tuberculosis cases, thus preventing contacts. I am firmly convinced that there must be provision for the treatment of every case in a sanatorium and that such hospitalization should be compulsory. The fact that this legislation existed would, I feel, be sufficient to persuade these cases to go without any force being used. The expense for the sanatorium treatment would be met through the provincial and municipal treasuries. It may be said that we have already in the Public Health Act in Ontario sufficient authority to compel the hospitalization of open cases which are a menace to public health. Every health officer is familiar with the difficulties attendant on such action. Personally I should not like to attempt to force any patient to go to a sanatorium under the provisions of the existing legislation. The provision of sanatorium facilities for every patient has proved to be the most effective means of reducing tuberculosis in Saskatchewan.

Excellent work is being accomplished in Ontario by the Provincial Department of Health through its Division of Tuberculosis Control. The provision of additional sanatorium accommodation, the addition of new clinics, and other assistance to health officers give promise of further advances against this disease. Such efforts, however, will be of only limited value unless there is the full co-operation of the practising physician and the active participation of every medical officer of health. Tuberculosis *can* be controlled.

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Influencing Factors in the Control of Tuberculosis in Ontario*

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THE primary purpose in this presentation is to focus the attention of the medical officer of health on the problem as it presents with the hope that the suggested solution may be considered sufficiently practical to justify local application.

The Situation as it Exists

In comparatively few centres in the province has a well organized effort been made to deal effectively with tuberculosis.

Reporting of Tuberculosis

If the medical officer of health is to carry out his duties to the municipality, the co-operation of practising physicians is very necessary. Relatively few physicians report their known cases of tuberculosis to the medical officer of health. Some report only when difficulties arise that are embarrassing to them.

There is no sound argument against the proper reporting of patients suffering from tuberculosis, even though no official local action takes place as the result of such reporting. When the family physician reports a case of tuberculosis he automatically shifts some of the responsibility for the proper disposition of the patient to the medical officer of health and the local authorities. Tuberculosis is a preventable disease and a community problem; therefore the interest of the family physician and the health officer should be identical.

It is embarrassing for the medical officer of health, who is the official health representative in his community, to learn that a resident of the municipality has been admitted to a sanatorium without his knowing the case existed. No help in securing sanatorium treatment for his patient can be expected by the practising physician from the local authorities if the case has not been reported.

Lack of Records

Many medical officers of health in the rural communities, and even some in urban centres, have no record whatsoever of the amount of tuberculosis

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existing in their municipalities. No records are kept of the names of patients receiving or having received treatment in sanatoria, let alone the names of the contacts of such cases. Without such records no systematic preventive work can be carried out.

Delay in Instituting Proper Treatment

It has been said that in the practice of medicine accuracy of diagnosis is primarily and finally imperative, yet of what use is a correct diagnosis of active tuberculosis if it is not associated with proper treatment and the prevention of infection to contacts?

In 1933 the travelling clinic of the Department of Health found two hundred and twenty-four cases of pulmonary tuberculosis needing active treatment in sanatoria. These cases were followed by letters to the referring physicians one year later and it was found that not more than 50 per cent of this group had received such treatment. The chief reason for this was the apathy, and occasionally the opposition, of the local authorities of already financially embarrassed municipalities to furnishing the aid necessary in the carrying out of the treatment advised.

Unnecessary Prolonged Stay of Some Patients in Sanatoria

There are in the sanatoria of Ontario a large number of patients requiring no further sanatorium treatment.

Recently almost all patients in sanatoria and preventoria have been reviewed by the staff of the sanatoria concerned together with the staff of the department. This survey revealed that there were approximately three hundred such patients. Some had homes in which satisfactory conditions existed for further care of the patient; in others, the conditions were unsatisfactory. Some were social problems in that they had no homes. Practically all these patients were considered non-infective but were unable to work, at least to earn a livelihood.

Continuing to treat these patients in sanatoria at the maintenance rate of $2.17 per day per patient is a costly effort for municipalities, counties, and government. Further, these patients are occupying beds that should be available for patients urgently needing active sanatorium treatment.

The Shortage of Sanatorium Beds

Sanatorium beds are needed in eastern Ontario. However, the lack of available beds at some periods of the year is not the main factor in the problem. If immediate efforts were made by local authorities and practising physicians to bring about early admission of patients to sanatorium, admission would be effected in one month. It has been our experience that frequently there is delay in making application for admission to sanatoria following a diagnosis. During the last year beds were available in most sanatoria within two weeks of application.

Lack of Facilities for Diagnosis

This state of affairs does exist in some areas, chiefly northern Ontario. No matter how skilled a physician may be, an x-ray is absolutely necessary before early pulmonary tuberculosis can be confirmed or eliminated in the majority of suspected cases.

In southern Ontario comparatively few municipalities are further than twenty-five miles from an x-ray unit. It would appear that some arrangement should be made whereby practising physicians might secure x-ray films on those suspected cases who are themselves unable to meet this expense.

SUGGESTIONS FOR IMPROVING THE SITUATION

In 1934 one of every 4.8 deaths in Ontario between the ages of 15-35 was due to tuberculosis. Discounting the large sums of money expended in treatment we suffer unnecessarily from this disease in terms of time lost through illness and the economic loss resulting from premature deaths. While tuberculosis is largely a house or home disease, industry plays a significant part. One is on safe ground in stating that morbidity and mortality in any community will be in proportion to the amount of infection taking place in homes and in industry. If the infection which is spread in the homes could be eliminated, the almost complete solution of the problem would be in sight.

For years the cry has been for earlier diagnosis yet we have made little headway in this regard. Less than 25 per cent of the patients entering sanatoria have minimal disease. This is, for the most part, due to the fact that no periodic examinations have been carried out among the known contacts—the potentially tuberculous. It has been demonstrated repeatedly that ten times as much tuberculosis will be discovered in this group as in a non-contact group.

By concentrating on the examination of contacts during the last few years, the Department's travelling clinic has increased the percentage of diagnosis in the minimal stage to 52 per cent.

It has been demonstrated that when an organized plan has been followed in a district there has resulted within a very few years a substantial lessening of disease, fewer deaths, and marked financial saving.

It would appear that this problem resolves itself into:

(1) Elimination of known cases of tuberculosis as foci of infection by early treatment and segregation, preferably in sanatoria.

(2) Periodic observation of contacts which should result in early recognition of those who may have acquired the disease as the result of close association with known cases.

Reporting of Tuberculosis

Reporting of tuberculosis should have as its object a proper investigation by the local authorities so that a satisfactory disposition of the patient may be brought about and those in contact kept under observation.

Considering the above, the Department has devised a form as illustrated.

NOTIFICATION OF TUBERCULOSIS

FOR USE OF ATTENDING PHYSICIAN

Patient's Name.....
Address.....
Age..... M.S.W. or Sep. Municipality.....
Country of Birth..... Date of arrival in Canada.....
Site of Tuberculous Disease.....
Classification (if pulmonary) Minimal Active Moderately Advanced Quiescent Far Advanced Apparently Arrested
Has sputum been examined? Yes No Date..... Positive Negative
Number of Contacts in Home—Adults..... Children.....
Occupation of Patient.....
Where Employed.....
No. of Contacts at place of work.....
Has patient been treated in Sanatorium?.....
If so, when and where.....
Recommendations: Be specific as to whether sanatorium treatment indicated.....
.....
.....
Attending Physician.....
Date..... Address.....

This form will be distributed to every physician in the province and an extra supply sent to all medical officers of health. Each physician will be requested, when he discovers a patient with tuberculous disease, to report the case on the prescribed form to the local medical officer of health who will, in turn, copy or have copied the particulars contained in this form on a second form to which he will add his own recommendation. The original form will be kept in the local health office and the copy forwarded to the Provincial Department.

If this procedure is carried out, it will enable the Department to keep records of all known cases of tuberculosis within the province. These forms will not be pigeonholed but will be used for definite purposes in connection with all tuberculosis clinics. The physicians concerned will be communicated with and suggestions offered regarding the examination of contacts and where these examinations may be most readily arranged.

Keeping of Records within the Municipality

There is no way of knowing the actual tuberculosis situation in any given community without the keeping of adequate records. It would seem advisable that these records be uniform in all municipalities. A card has been prepared for the use of medical officers of health.

While this card will undoubtedly meet the needs of the bulk of the health officers, it may in some of the larger centres need some modification in keeping with local conditions. Very few part-time health officers will have to do with more than ten cases of tuberculosis each year and the filling out of this card on each case will take very little time and it will enable the medical officer of health to know, among other things:

(1) The families represented by tuberculosis in his community.
(2) Number and names of patients being maintained in sanatorium by his municipality and those under treatment at home.

(3) Number and names of contacts of each case and the necessary information concerning them.

The information contained on these cards will be of real value to the medical officer of health. They will permit him to take stock at any time of the tuberculosis situation within his municipality.

The data contained will also assist him when arranging appointments for the travelling or locally operated clinics, and will eliminate the possibility of patients and contacts who should be re-examined being overlooked.

Maximum Benefit Cases in Sanatoria

Efforts are being made to have these patients discharged from the sanatorium and preventorium at the earliest possible moment. Some will require extra relief in their homes; others will have to be boarded by the municipality. It should be pointed out that a considerable saving will be brought about by this procedure. To maintain a patient in a sanatorium costs the county and municipality each $5.25 per week. Most patients could be boarded for from $5 to $7 per week; the difference between the price of board and lodging and the $10.50 weekly maintenance rate would be saved.

Practically all of these patients are non-infective; some of these may become infective at a later date, so for this reason they should be boarded in homes in which there are no children.

Speeding up Admission to Sanatoria of Patients Requiring such Treatment

If the case is reported to the medical officer of health and sanatorium treatment advised by the patient's physician, it would appear to be the duty of the medical officer of health to assist in any way possible in bringing about this admission at the earliest possible moment. Practising physicians have a right to expect this assistance.

The medical officer of health should make sure that the name of the patient is placed on the waiting list of a sanatorium either by the attending physician or himself.

Further, he should, if the local board of health or municipal council shows reluctance to pay maintenance of such patients, explain to these bodies the necessity of this type of treatment, not only for the good of the patient but for the protection of others in contact. Municipal authorities and all citizens should know that if an open case of tuberculosis is removed or made non-infective, a source of needless economic waste is removed.

Facilities for Diagnosis

Recognizing the place of facilities for early diagnosis in the solution of the problem, the Department last year increased the personnel of its travelling clinics, making possible three travelling clinics and the central office clinic. One travelling clinic has its headquarters in Ottawa, visiting fifteen centres in eastern Ontario. The second clinic, with headquarters in Belleville, serves fifteen centres in mid-eastern Ontario. The third clinic, with headquarters

in North Bay, provides for the area west to Sault Ste. Marie and north to Hearst. The central office clinic will conduct clinics in southern Ontario not served by either permanent clinics or sanatorium clinics. This clinic will also visit ten centres in northern Ontario each year. Thus the Department's clinics will visit approximately eighty centres annually and in some instances every six months. In addition to these services there are forty regular or permanent clinics, the majority of which are arranged through the co-operation of the sanatoria. It must be remembered that only patients referred by physicians are examined by the travelling clinics. The value of the clinic facilities is being increasingly appreciated and it surely behooves all concerned to make the most use of the service offered.

THE PROBLEM OF THE NON-CO-OPERATIVE PATIENT

In any discussion of control measures reference must be made to the active case who refuses sanatorium treatment and is otherwise non-co-operative. Some of these patients might be classed as incorrigible.

During the past year a number of letters have been received from medical officers of health and practising physicians requesting advice in dealing with careless open cases of tuberculosis in contact with children. Some physicians complained that the health officers refused to take any action and the health officers stated that they had no specific authority to deal effectively with these infective patients.

Sections 4 and 5 of the Regulations for the Control of Tuberculosis read:

"The local Board of Health or Medical Officer of Health shall maintain whatever supervision they may deem necessary over the case and if in their opinion the health of others dwelling in the same house or in personal contact with the patient is threatened, they shall order the removal of the patient to a hospital or sanatorium. The Medical Officer of Health shall have power to exclude open cases, considered dangerous to others, from school, occupation, or business."

"Every such patient shall remain in such hospital or sanatorium until in the opinion of the Medical Officer of Health he may safely be allowed to return to his former place of abode."

The above might be called enabling legislation. It is rarely put to the test and if the medical officer of health is successful in having a refractory patient removed to the sanatorium under threat or by a magistrate's order, he frequently finds the patient at large again within a few days. The patient has entered a sanatorium, probably remained a day or so, and then left of his own accord.

Coercive legislation requires much thought and very careful administration. The incorrigible patients constitute a small part of the tuberculosis problem, yet they are dangerous out of all proportion to their numbers.

From the experience of all interested it would seem that friendly adjustment regarding the breaking of contact may be arrived at in the majority of cases by persuasive means. The patient should have explained to him the reasons why he should enter and remain in the sanatorium.

In dealing with other cases it would appear that some coercive legislation

is necessary to strengthen or make possible the putting into effect of the enabling legislation. In one city in the United States compulsory legislation is in effect. If persuasion concerning sanatorium treatment fails, the house is placarded. If the patient still refuses treatment forcible hospitalization is brought about.

Rule V of the Illinois Department of Public Health reads:

"No child under the age of sixteen years shall live in the same home, apartment, or other place of abode or habitation occupied by a person suffering from active or open pulmonary tuberculosis (consumption) unless proper precautions are being observed as required by this rule and unless there is no contact between the person suffering from active or open pulmonary tuberculosis and other members of the family."

In Great Britain compulsory segregation is made possible by Section 62 of the 1925 Public Health Act of England and Scotland, which reads:

"Where it is proved to the satisfaction of a court of summary jurisdiction (*a*) that any person suffering from pulmonary tuberculosis is in an infectious state; and (*b*) that the lodging or accommodation provided for that person is such that proper precautions to prevent the spread of infection cannot be taken, or that such precautions are not being taken; and (*c*) that serious risk of infection is thereby caused to other persons; and (*d*) that a suitable hospital or institution exists for the reception and accommodation of that person; the court, upon the application of the county council or of the local authority, may, with the consent of the superintending body of the hospital or institution, make an order for the removal of that person to that hospital or institution and for his detention and maintenance therein for such period not exceeding three months as the Court think fit."

In practice it has been found seldom necessary to take action under the above Act.

CONCLUSIONS

1. More organized effort to control tuberculosis is necessary in most Ontario municipalities. In comparatively few centres are to be found records of known tuberculous cases and contacts. This is in part due to failure on the part of the attending physician to report his cases.

2. There is unnecessary delay in bringing about sanatorium treatment for patients from many municipalities, especially those in financial difficulties.

3. Sanatorium beds are urgently needed in eastern Ontario.

4. Many northern Ontario centres and some isolated centres in southern Ontario lack diagnostic facilities.

5. Discharge from sanatoria of patients who have received maximum benefit is being delayed due chiefly to lack of effort on the part of municipal authorities to assume responsibility for after care.

6. It would appear that some strengthening of the Regulations for dealing with non-co-operative cases is indicated.

7. Greater co-operation is required between the local medical officer of health, the municipal council, the board of health and the attending physician.

A New Method of Detecting Staphylococcus Enterotoxin

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THIS communication is a preliminary report recording the suitability of kittens as test animals for the detection of enterotoxin, or the food poisoning substance, in staphylococcal filtrates.

Historical

Within recent years much attention has been given to the diversity of toxic substances present in filtrates prepared, under appropriate conditions, from certain strains of staphylococcus. Following the Bundaberg disaster, the first of a series of papers was published by Burnet in 1929 (1), which revived a long dormant interest in the haemolytic, necrotizing, and acute lethal substances produced by certain staphylococci. These properties are now accepted as manifestations of a specific bacterial exotoxin. In the following year, Dack et al. (2) reported an outbreak of food poisoning apparently due to a toxic substance liberated by staphylococci present in the incriminated food; and several similar outbreaks have since been reported by Jordan and his colleagues and from other American sources. Two distinct avenues of approach to problems relating to the toxigenic capacity of staphylococci were thus almost simultaneously laid down; and both have led to results of great theoretical interest and practical importance. On the one hand, a growing realization of the probable significance of the specific exotoxins in the pathology of staphylococcal infections, has resulted in their antigenic properties being utilized for the production of staphylococcus toxoid and antitoxin. On the other hand, staphylococcal contamination of foodstuffs, in particular of milk and milk products, is now recognized as a potential cause of food poisoning outbreaks.

That staphylococcal haemolysin and its associated toxic substances are distinct from the staphylococcal food poisoning substance was demonstrated by Woolpert and Dack (3), using monkeys as test animals, and by Dolman (4), who reported that human volunteers might drink with impunity relatively large amounts of highly potent haemolysins prepared from certain staphylococcal strains; while much smaller amounts of a filtrate from one particular strain evoked symptoms of acute food poisoning in several volunteers. Research into the chemical nature and antigenic structure of staphylococcus enterotoxin, its mode of action, and the conditions which favour its production, has been hampered by lack of a convenient laboratory test for detecting its presence.

Extensive use of the human volunteer is neither valid nor expedient. The susceptibility of M. rhesus monkeys, first reported by Jordan and McBroom (5), has been confirmed by various workers; but monkeys are neither readily procured nor easily handled. Borthwick (6) defined certain conditions under which rabbits and guinea pigs could be used for the detection of the presence of the food poisoning substance in staphylococcal filtrates. But no confirmation of these results has been reported, and our own attempts to reproduce them have been entirely unsuccessful.

The cat is more akin to human beings than are the rodents in dietary and excretory habits; is less prone to vomit than the dog; and is a more convenient and economical experimental animal than the monkey. Preliminary tests were therefore conducted on a cat, using a filtrate prepared from a strain of haemolytic, cream-coloured staphylococcus, originally isolated from the nasal mucous membrane of a human being. One and one-half cc. of filtrate from this strain ("B": vide infra), had previously caused one of us to vomit violently within two hours after ingestion. Fifty cc. of the same filtrate was lapped up by the cat in milk, and caused projectile vomiting some 2½ hours later, followed within the next few hours by several loose stools. A similar result was obtained with 10 cc. of a filtrate concentrated by evaporation under low pressure. On an earlier occasion a volunteer had vomited after taking by mouth 1 cc. of a formalinized filtrate prepared from this particular strain, and very small subcutaneous doses of the formalinized filtrate had caused nausea and vomiting in a few human subjects. The most feasible explanation of these facts seemed to be that the enterotoxin resisted the detoxicating action of formaldehyde, and further, that it might take effect when administered parenterally. Our results to date have been in keeping with the above interpretation.

ENTEROTOXIN SYNDROME IN KITTENS

Intraperitoneal injection of about 2 cc. of formalinized filtrate, prepared from an enterotoxin-producing strain of staphylococcus, will cause a very characteristic syndrome in kittens. Marked lassitude and weakness, with unsteadiness, comes on shortly after the injection and culminates (often in from 15-30 minutes) in the first of a series of intermittent paroxysms of vomiting, associated with diarrhoea. The kitten may appear extremely ill for several hours, but recovery, when it sets in, is usually rapid and complete. Following a large dose of a potent filtrate, the kitten may develop progressive weakness, and die about 24 hours after the injection. In such cases, at autopsy there is a conspicuous absence of the petechial haemorrhages and general vascular engorgement present in animals dying acutely from the effects of staphylococcus exotoxin. No constant abnormalities have been noted in the lungs, heart, liver or kidneys. The gall bladder has in each instance been engorged with bile, the urinary bladder firmly contracted. The gastro-intestinal tract has shown a very excessive secretion of mucus throughout its length, *but no gross inflammatory changes have been detected.*

DOSAGE

As little as 0.5 cc. intraperitoneally of a potent filtrate will cause a severe reaction in a kitten weighing 350-550 gms., and aged around 6-8 weeks; while 3 cc. of filtrate from innocuous strains, or of formalinized broth, will occasion no upset. Adult cats may be used for the test, but are harder to handle, and seem relatively less sensitive than kittens. The following experiments are representative of many others, and are self-explanatory.

Kitten A received 0.5 cc. filtrate "B" intraperitoneally. It vomited 15, 25, 30, and 150 minutes later, and had several loose stools. Subsequently it was somnolent, and seemed very weak for some hours. Eight hours later it appeared to be recovering.

Kitten B received 1 cc. of filtrate "855/5" intraperitoneally, without effect. Three hours later it received 2.5 cc. of filtrate "855/5" intraperitoneally, but there was no effect within 2¼ hours.

Kitten C received 1 cc. of filtrate "156/2" intraperitoneally, without effect. Three hours later it received 2.5 cc. of filtrate "156/2" intraperitoneally. It vomited in 75 minutes, and became very languid and weak.

Kitten D received 1 cc. of filtrate "159" intraperitoneally, without effect. Three hours later it received 2.5 cc. of filtrate "159" intraperitoneally. There was no effect within 2¼ hours. It was then given 0.5 cc. of filtrate "B" intraperitoneally. It vomited in 75 minutes, and showed marked lassitude for several hours after. It also had diarrhoea.

Note: Strains "B" and "159" were haemolytic, while strains "855/5" and "156/2" were non-haemolytic, when grown on sheep blood agar plates. "B" produced cream-coloured colonies, "159" golden, "855/5" lemon yellow, and "156/2" white colonies. Strain "B" was isolated from a human nasal mucous membrane, and the other three strains were isolated from raw milk bottled for local distribution.

PREPARATION

All the filtrates used in our experiments have been prepared by inoculating plates of semi-solid nutrient agar medium with the strain of staphylococcus under investigation, harvesting after 40 hours' incubation at 37°C. in an atmosphere of 30 per cent carbon dioxide and 70 per cent oxygen. The suspension is freed from agar by passing through cheese cloth, and is then Seitz-filtered. To the filtrate, 0.3 per cent solution of formaldehyde (U.S.P.) is added, and the formalinized filtrates are kept in the incubator at 37°C. until rabbit and sheep cell haemolysins (α and β toxins) are no longer detectable. They are then ready for testing on kittens for the presence of enterotoxin. This method of preparation eliminates the deleterious effects which would result from injection of filtrates containing potent haemolytic, necrotizing, and lethal exotoxin. In our more recent experiments advantage has been taken of the greater heat stability of the enterotoxin as compared with the α and β toxins. Filtrates have been placed in a boiling water bath for ½-hour prior to injection. Only negligible amounts of α and β toxins survive this treatment, but enterotoxin, where present, proves heat-stable.

DISCUSSION

The foregoing method for the detection of staphylococcus enterotoxin is believed to be an improvement upon methods hitherto reported.

In passing, it may be stated that the cultural method described by Stone (7) as permitting the detection of staphylococci of "food poisoning type", has in our hands yielded results out of conformity with those given by the kitten test. Strain "B", for instance, which has consistently proved our most potent enterotoxin-producing strain, as judged by the ability of small amounts of filtrate to evoke the characteristic syndrome in both human volunteers and kittens, gave no gelatine liquefaction, *i.e.*, a negative reaction, under the conditions described by Stone.

Further evidence is afforded, by the experiments described, of the distinction between staphylococcal haemolytic, necrotizing and acute lethal substances (the "exotoxin"), and staphylococcal food poisoning substance (the "enterotoxin"). The latter may be demonstrated in filtrates after all the former have been detoxicated by incubation with formaldehyde, or by heating to 100°C. for 30 minutes.

The gastro-intestinal tract appears to be the seat of origin of the main symptoms characteristic of staphylococcal food poisoning, or of the ingestion of certain staphylococcal filtrates; and in view of this fact the term "enterotoxin" for the causal substance appears justified. But this enterotoxin can no longer be regarded as a direct gastro-intestinal irritant, since the same symptoms are rapidly evoked in kittens by intraperitoneal administration of potent filtrates; and since the gastro-intestinal tract shows no evidence at autopsy of having been subject to the action of an acute irritant. The pharmacology of the reaction merits and requires detailed study.

Woolpert and Dack (3) reported the successful active immunization of a rhesus monkey against the enterotoxin; but attempts at passive immunization failed. Our own preliminary experiments indicate that the enterotoxin is antigenic. Kittens given several spaced injections of enterotoxic filtrate became resistant. Blood serum from one such kitten neutralized the enterotoxic properties of an equal volume of the potent filtrate "B", so that the mixture proved innocuous when injected into a normal kitten. Further experiments of this type are proceeding, and will be reported later with detailed protocols.

A fair proportion of rhesus monkeys appear from reports to be naturally insusceptible to enterotoxin; but we have not yet encountered a naturally insusceptible kitten. This is another strong point in favour of the use of this animal.

Various strains of staphylococcus isolated from raw cow's milk have yielded filtrates which caused vomiting, diarrhoea, collapse, and even death in kittens following intraperitoneal injection of amounts of from ½ cc. to 3 cc. Among the positive enterotoxin producers have been non-haemolytic albus strains, and among the negatives have been haemolytic aureus strains.

Strain "B", which produced a very potent enterotoxin, also produced highly potent exotoxins of both α and β type, and in virtue of this latter property was used with several other strains in the production of pooled toxins for conversion, by formalinization, into toxoids for administration to human beings. The evident failure of formalinization to detoxicate the enterotoxic component of

certain filtrates within the time which suffices to render inert all the haemolytic, necrotizing, and acutely lethal substances contained therein, makes it most desirable that no enterotoxin-producing strain of staphylococcus should be used in the production of staphyloccccus toxoid for active immunization of human beings. As an additional safeguard, it is suggested that to the tests for innocuity of staphylococcus toxoid recommended by Dolman and Kitching (8) should be added the further requirement that 3 cc. of the toxoid, injected intraperitoneally into a normal kitten, should occasion no deleterious symptom.

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The Treatment of Human Brucellosis

A SUCCESSFUL method for the treatment of brucellosis still awaits development, for as yet no therapeutic agent has been found which has been proved to alter, to a significant degree, the natural course of the disease. A noteworthy agreement that the average duration of the disease is 3 months is revealed by a survey of many reports. More striking still is the finding that this average period of illness prevails in treated cases irrespective of the type of therapy employed. All of the therapeutic measures discussed in this review evoke a systemic reaction. We believe that it is this response, associated with increased fever and corollary phenomena, which is responsible for beneficial results rather than a specific reaction.—Charles M. Carpenter and Ruth A. Boak, *Medicine, 15*:103, 1936.

A Small Outbreak of Staphylococcal Food Poisoning in Vancouver

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MANY outbreaks of food poisoning traced to contamination of foodstuffs with staphylococci producing an enterotoxin have been reported within the past six years. Following the classical account by Barber (1) in 1914, of recurrent gastro-enteritis affecting visitors to a farm in the Philippine Islands, attributed to consumption of cow's milk contaminated with a white staphylococcus, some sixteen years elapsed before Jordan and his colleagues in Chicago drew renewed attention to the occurrence of staphylococcal food poisoning. The relevant literature is now too extensive to survey in a brief report of this nature. However, the following facts are noteworthy: that raw milk and products made therefrom, such as ice cream, cheese, and cakes and pastries containing cream and custard filling, account for a high proportion of the recorded outbreaks, e.g., Jordan (2), McBurney (3), Crabtree and Litterer (4), Shaughnessy and Grubb (5): that such diverse vehicles as chicken gravy (Jordan and Hall (6)), sweet potato candy, ham (Costa Mandry (7)), and tongue sandwiches (Dack, Bowman, and Harger (8)) have also been implicated: further, that with the possible exception of one outbreak ascribed to imported butter in England (Fanning (9)), no instances of staphylococcal food poisoning have been recorded outside the United States and its past and present dependencies.

The contention that staphylococcal food poisoning is confined almost entirely to the United States is untenable. But in other countries the acknowledged ubiquity of staphylococci still serves to hinder recognition of their versatility. Dietetic habits and climatic conditions in Canadian cities are in general similar to those pertaining in the United States. Health officers and public health laboratories should be cognisant of the possibility that many outbreaks and individual cases of gastro-enteritis simulating food poisoning may be due to the consumption of staphylococcus enterotoxin.

The following small outbreak of staphylococcal food poisoning which occurred recently in Vancouver is described not only because it is believed to represent the first of its kind recorded in Canada, but also because several interesting facts and problems are illustrated thereby:

Mrs. R. (aged 60) purchased some "vanilla slices" from a retail confectionery store in Vancouver at about 10 a.m. on September 5th. They were brought home and kept in a paper bag at room temperature until lunch time. The slices consisted of two thin layers

of puff pastry, with apple and custard filling between, and covered on top with a coating of white sugar icing.

During the morning, Mrs. S. (aged 40) visited Mrs. R. and was given a portion to take home for lunch.

At 1 p.m. on the same day, Mrs. R. and her son (aged 40) made a luncheon of sliced tomatoes, tea, and vanilla slices. Each took a single portion, about 3½ inches square, of the latter. The flavour and appearance were quite normal.

At 5 p.m. Mrs. R. became ill. Her limbs grew numb, objects appeared dim, she felt nauseated, and vomited violently twice. Mr. R. assisted his mother to bed, and at 6 p.m. himself became ill in similar fashion. An attempt was made by telephone to obtain help from Mrs. S., but she proved to be too ill, with the same symptoms, to answer the telephone. All three affected persons had violent diarrhoea subsequent to the vomiting attacks. By 10 p.m. of the same evening they had all practically recovered.

The only food consumed in common was the vanilla slices. A daughter in the R. family, and a son in the S. family, who did not partake of them, remained well.

Half a portion of one of the remaining vanilla slices was examined bacteriologically two days later at the Provincial Board of Health Laboratories and also at Connaught Laboratories, Western Division. Emulsions were made, in nutrient broth, of small portions of the pastry, apple filling, custard filling, and sugar icing, and thence plated on to sheep blood nutrient agar plates. The pastry and custard filling yielded a few cream-coloured colonies of haemolytic staphylococcus, many minute colonies of a non-haemolytic long chain streptococcus, *B. proteus,* and also colonies of a gram-negative bacillus. One of the last-named colonies was transferred to McConkey's medium, and the sugar reactions determined. The reactions were those of *B. asiaticum.* The apple filling yielded similar findings, plus unidentified gram positive bacilli. From the sugar icing many cream-coloured colonies of haemolytic staphylococcus were obtained in almost pure culture. One gram of icing substance yielded, by calculation, at least 200,000 colonies of this staphylococcus.

A sterile filtrate was prepared from the staphylococcus present in the icing by the method described (10).* The filtrate contained 1,000 α haemolytic units per cc. It was heated at 100°C. for 20 minutes to destroy the α toxin. Three cc. of the supernatant fluid was inoculated intraperitoneally into a young cat weighing about 1 kg. Violent vomiting occurred in about twenty minutes and was repeated three times within ten minutes. Fluid stools were passed. The animal appeared intensely nauseated, and vigorous peristaltic movements were noted through the abdominal wall. Eighteen hours after inoculation the cat still seemed weak, but ultimately made a complete recovery.

The earlier history of the vanilla slices and their ingredients, as far as could be ascertained, was as follows:

The bakery was of poor quality. An open sewer ran beneath it. One man was responsible for the manufacture of the vanilla slices. The dough, comprising fat, flour, salt and water, rolled into thin layers of pastry, was baked for ten to fifteen minutes at 300-350°F. The whole process, from first mixing of the dough till completion of the baking,

**In view of the attention given in certain quarters to the gelatine-liquefaction test described by Stone as a means of identifying enterotoxin-producing strains of staphylococcus, it may be mentioned that the strain under investigation gave a negative reaction, i.e. did not liquefy gelatine under the conditions prescribed by Stone.*

was completed between 8:30 and 10:30 p.m. of the evening of September 4th. The custard filling was prepared the same evening from a mixture of pasteurized milk, liquid eggs, and cornstarch, which was boiled, and allowed to cool. When cool, it was spread with a spoon on to a layer of pastry upon which a thin layer of stewed apple had already been spread, and another layer of pastry was then superimposed. The icing, consisting of icing sugar in water, had been freshly made and was spread on with a knife. The whole was then cut into slices and sent to the packing room, whence it was sent out to the retail store at 7 a.m. on September 5th, to be purchased six hours later by Mrs. R.

The baker was in good health, with no boils, acne, or other apparent staphylococcal infection. Swabs from nose and throat proved singularly free from staphylococci.

DISCUSSION

Provided the vanilla slices were freshly made, as claimed by the retail store, it would appear that sufficient staphylococcus enterotoxin to cause gastro-enteritis was produced within a maximum possible period of 14 hours—the time elapsing between the manufacture and consumption of the confection. The air temperature ranged from 54° to 73° on the two days of September 4-5. That enterotoxin production should be possible under such conditions of time and temperature and in seemingly so unfavourable a medium as sugar icing, is indeed remarkable and clearly indicates that the most stringent precautions should be observed at all stages of the manufacture of food products of this type. No handling whatever should be permitted; guns, spreaders, and utensils of all kinds should be sterilized before use; the confections should be wrapped, and stored at refrigerator temperature. The fact that no complaints are on record from persons consuming other portions of the vanilla slices would suggest that contamination perhaps occurred at the time of slicing, or possibly during the packing process, when handling took place. On the other hand, sporadic cases of gastro-enteritis due to staphylococcal food poisoning, though doubtless very common, would rarely be reported, owing to the transient nature of the symptoms.

The characteristic symptomatology of staphylococcal food poisoning is well illustrated by these cases: onset of vomiting and diarrhoea within 4—5 hours of consumption of the contaminated food, with marked dizziness and nausea, followed by fairly rapid recovery. The cramps noted in some other outbreaks were absent in this instance.

Finally, it is especially noteworthy for public health laboratory workers that when staphylococci are isolated from foodstuffs incriminated in outbreaks of this type, they should be regarded as of considerable possible significance. In this instance, the presence of an open sewer beneath the bakery, and the isolation of *Bact. asiaticum* from the vanilla slices, although connoting local conditions of sanitation which should be deplored, almost certainly had no bearing upon the cases reported.

ACKNOWLEDGMENTS

I desire to record my appreciation of the technical help received from colleagues of

the Provincial Board of Health Laboratories, and of Connaught Laboratories, Western Division; and also of the co-operation shown by Mr. R. Skinner, Sanitary Inspector to the Vancouver City Health Department.

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Reducing Tuberculosis Among School Children in Saskatchewan

TUBERCULOSIS among the school children of Saskatchewan is being reduced. In 1921 over one thousand school children were tested, and every second child gave a positive skin test for tuberculosis. A positive skin test means infection, but not necessarily active disease. However, a person with infection may develop active disease.

During the past two years we have examined over forty-seven hundred school children and have found that only 10 per cent reacted positive to the skin test. The infection has been reduced to about one-fifth of what it was fifteen years ago. This reduction has been secured by the examination of contacts in the family; by examination of suspected children referred by their physicians; by the treatment of all adults who fall sick with tuberculosis. Remove the sick from the home and from the school, treat them in institutions until well, and the amount of disease and the spread of infection is greatly reduced.—R. G. Ferguson: General Examination of School Children, *The Valley Echo*, vol. 17, no. 3, 1936.

Progress in Cancer Control in Saskatchewan

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IN establishing the King George V Silver Jubilee Cancer Fund in Canada many references were made to the extent of the mortality from cancer in the Dominion, approximately 10,000 deaths each year. In connection with the toll of cancer deaths, I would like to refer to a statement made by the late Dr. Joseph Colt Bloodgood of Johns Hopkins University: "If all the information available regarding cancer was properly made use of by the medical profession and public alike, 30,000 deaths could be prevented out of the 120,000 annually occurring in the United States." It would appear reasonable to assume that Canada should be able to do as well. It would mean an annual saving of at least 2,500 lives.

We hear frequently the complaint that we do not know the cause of cancer. Quite true; and I admit fully the importance of this information in the ultimate control of the disease. I wonder, however, if we are not imitating the ostrich instead of endeavouring to accomplish what is possible.

I need only remind you that there are other diseases also for which we have no specific drug or serum. Yet we know to-day what surgery, radium, and x-rays will accomplish in the treatment of cancer under proper conditions. We have no specific cure for tuberculosis, yet I am certain that no competent person will contend that little progress has been made in the control of this disease. You can all recall the time when smallpox, tuberculosis typhoid fever, and diphtheria were four of the most feared diseases. To-day these are being relegated to the background. Heart diseases and cancer are now responsible for the greatest number of deaths and demand the attention of all responsible health authorities. In Saskatchewan we feel that so much success has been obtained in our anti-tuberculosis program that it is our hope and objective to place our cancer program in the same category.

The Saskatchewan Cancer Program

At the present time we have a central commission provided for by the Saskatchewan Cancer Commission Act. We have established two consultative diagnostic clinics, one in Saskatoon and one in Regina. Patients are referred by their attending physicians as cases of cancer or suspected cases of cancer, and only such are examined. In this way you will see that a considerable amount of the ground-work is done by the practising physicians. Each clinic has a competent radiotherapist, a surgeon, and an internist. The pathologist and the radiologist of the hospital in which the clinic is established are also available for the consultations.

Treatment is also provided at each clinic so far as the application of radium and x-ray are concerned, under competent personnel. Radium is used only in the clinics. This treatment is centralized and none of the radium owned by the Commission is used other than in the clinics.

Cancer has been made a reportable disease under authority conferred upon the Commission and we have noted that only 50 per cent of the reported cases have passed through the clinics. While excellent co-operation has been extended by the medical profession, one can understand that the purely surgical and definitely surgical types of the disease are to a large extent being attended to in other institutions.

Certain statistics from our records bring out interesting data:

Total admissions during a period of 4 years	2,417	cases;		
Cancer	1,513	or	63	per cent
Pre-cancer	67	"	2.7	" "
Not cancer	774	"	32	" "
Pending diagnosis	63	"	2.6	" "

Of the 1932 cancer cases 43 per cent are now alive.
" " 1933 " " 50 " " " " "
" " 1934 " " 61 " " " " "
" " 1935 " " 75 " " " " "

The average age of the 2,417 cases is 54.8 years.

Information relating to condition on arrival at clinics may be obtained from the prognoses of the consulting staff. Thus we find that 1,387 of the 2,417 cases of cancer were defined as follows:

Operable; probable cure	796 cases.
Operable for palliation only	394 "
Inoperable	197 "

From this information some indication is derived of the stage of condition when the patient arrived at the clinic. It may be assumed that most of the 796 cases above were in the early stages and the remaining two groups quite advanced. Therefore only 56.2 per cent were favourably considered.

That the prognoses were fairly well justified may be realized from the following results:

PERCENTAGE LIVING AS AT FEBRUARY 29, 1936

PROGNOSIS	1932	1933	1934	1935
Operable; probable cure	61.6	79	83	92.7
Operable for palliation only	15.6	19	40	74
Inoperable	26	16	20	50

Stage of Condition

Dealing with the actual cancer cases admitted in 1932 and 1933, which total 697, the following will indicate the attitude of patients and their delay in consulting a physician, even after suspicious symptoms were noticed by them:

71 or 10.2 per cent consulted a physician at once.
194 or 27.9 per cent consulted a physician from 1 to 3 months after.
118 or 16.9 per cent consulted a physician from 3 to 6 months after.
147 or 21.1 per cent consulted a physician from 6 to 12 months after.
167 or 23.9 per cent consulted a physician from 12 months after, most of these being between 1 and 2 years after.

Only ten per cent of these cases took immediate action.

At one of our own clinics a series of 200 cases of cancer who came late were closely questioned in relation to this matter of delay, and 413 explanations were given:

1. "It has never given me any pain."
   32 cases.....16 per cent.
2. "I did not think it was serious."
   64 cases.....32 per cent.
3. "I have long intended to have the condition examined, but just kept putting it off."
   Procrastination—25 cases.....12 per cent.
4. "I felt I could not afford to have it attended to."
   39 cases..... 9 per cent.
5. "I did not know anything was wrong."
   28 cases..... 6 per cent.
6. "I thought the condition was just natural."
   44 cases.....10 per cent.
7. "I was afraid it might be cancer."
   Cancer-phobia—25 cases.....12 per cent.
8. "I was afraid of an operation."
   21 cases.....10 per cent.
9. "I never thought of cancer."
   22 cases.....11 per cent.
10. "I previously had been advised that nothing was wrong."
    25 cases.....12 per cent.
    (Misdirection: very serious. Twenty-five patients who, had their condition been properly diagnosed in the first place, could probably have been cured, gave this answer.)
11. "I have been trying various treatments thinking it would get better."
    20 cases.....10 per cent.
12. "I thought it was just indigestion, or some such commonplace condition."
    70 cases.....17 per cent.

Analysing these answers we find that absence of pain, simple procrastination, fear, and misdirection make a most unfortunate contribution to the terminal picture that is so frequently seen. But ignorance is the reason most frequently mentioned and, let me say, ignorance is the cancer patient's greatest enemy.

Many studies have been made regarding the lateness in the disease in which patients consult their physicians. Our figures do not convey the proper conception of the situation except in so far as the clinics are concerned, simply for the reason that our cases are all referred and so a preliminary sifting process operates before the patient arrives at the clinic. Studies made by other investigators, however, indicate that approximately 30 per cent of cases consult their physicians at a time when cure can be expected. Thirty per cent more are amenable to prolongation of life with reasonable comfort by palliative measures, by surgery, radium or x-ray, but the balance of the 100 per cent are incurable.

This condition is the one which demands attention and serious attention

from the professions, the voluntary and official health agencies, and the public in general. Irrespective of the cause of cancer, or whether we have a specific cure or not, much can be done and should be done to correct the defect in early diagnosis and treatment.

THE MEDICAL PROFESSION

None of us has any doubt that the medical profession of Canada is of a standard equal to that of any other country with the same facilities for medical work. We know that our physicians can stand shoulder to shoulder with those from any other area; at the same time, experience in any field is necessary to develop experts in any specialty. The diagnosis and treatment of cancer is, or is fast becoming, a definite specialty, just as is the diagnosis and treatment of tuberculosis. Figures from Massachusetts indicate that the average physician sees only two cases of cancer each year. In Saskatchewan a survey in 1929 showed that out of 543 physicians in the province 61 per cent answered a questionnaire, and 124 of these had not seen one case of cancer that year, while the remaining 217 had seen only one or more.

There is a big field for the medical profession in providing postgraduate instruction to its own members in the early diagnosis and proper treatment of this disease. It is obvious that the physicians should occupy the front line trenches in a cancer campaign. It is not expected that all can be specialists in cancer, but they must be cancer-conscious and ready and able to detect the first indications of cancer in their patients and be ready also to refer them to where they can obtain the benefit of the best advice and expert treatment.

THE PUBLIC

The experience of the other programs indicates quite clearly the necessity for public education if any measure for the promotion of health is to be successful. Why complain if the patient does not present himself early enough to his physician if he does not know that he should do so? When we can convince the average man and woman who appear to be in good health to have a regular periodical medical examination, much will have been accomplished in the control of cancer, as well as in the prevention of heart damage.

The Saskatchewan Cancer Commission is a branch of the British Empire Cancer Campaign. During the drive for the King George V Silver Jubilee Fund a provincial committee was formed and we propose to maintain this group as a lay committee to our branch of the British Empire Campaign.

The Importance of Accuracy in Vital Statistics*

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IN the preparation of mortality tables lives are classified according to impairments present at the time of entry. It is of vital importance to insurance companies that the information submitted be as nearly as possible accurate; otherwise, the results of any investigation carried out will not reveal the actual mortality in the class studied. It is, therefore, important that those who are completing forms should realize how essential it is for the preparation of mortality tables that information relating to births, deaths and illness should be exact in every detail.

Those who are responsible for recording the material from which statistical studies are compiled must make certain that the evidence reported is based upon exact and carefully recorded history as well as observed facts. Otherwise the conclusions arrived at may be quite misleading. Fashions in diagnosis and certification increase the recorded frequency of death from some causes and decrease that from others. The popularity of coronary disease as a cause of death at the present time is typical.

We cannot stress too much the importance of exact information in certification and our efforts will be fruitless unless we have a definite objective. This objective should be the greatest possible degree of accuracy in completing reports either of illness or death. No form can meet every possible situation but the careful physician should be able to differentiate between essentials and non-essentials. In certification too often the primary or predisposing disease is overlooked and the terminal event recorded as the actual cause of death.

A fact is something which has been established as the result of careful investigation. Proof of the procedure of study in any case may be accepted as evidence. Too often we make decisions upon incomplete or insufficient evidence. In life insurance work all too often the examining physician appears not to recognize the importance of exact details regarding the development of an illness, the order of appearance of symptoms and signs, and other pertinent information of an exact nature. It would be well for the future if medical students could be given a training in one of the pure sciences where accuracy and exactness are fundamental. They should at least be taught how important it is in completing forms that information relating to birth, death or ill health be accurately recorded; that otherwise the conclusions arrived at from a study of vital statistics will be misleading.

Physicians, as a group, are often too willing to accept as proof evidence of

*Presented at a conference of the Section of Vital Statistics and Epidemiology, Canadian Public Health Association, Toronto, May 4, 1936.

the most exiguous character and, in reporting an illness or death, all too often deal in generalizations rather than in an exact record of established fact or events. This is largely the result of our training since to most physicians the importance of exactness in official records is not apparent. "A day less or more at sea or on shore we die, does it matter when?" In our work particularly, however, it does matter and it is especially important that the exact "when, where, and how" be stated.

The medical examiner's report to a life insurance company becomes part of the contract. It is necessary, therefore, to establish beyond reasonable doubt the nature of each illness and the exact date when symptoms first were observed. In reporting death or incapacity it is important to establish which condition of two or more preceded the other. This is particularly important when a person suffering from a serious disease meets with an accident and death results. Was the condition which existed prior to the accident the cause of death or was the accident a contributory factor? These are questions which are frequently submitted to us for a decision.

Accuracy in certification will improve in relation to the degree of interest which we are able to create among physicians in general. Interest might be stimulated if reports could be simplified and made more intelligible to the average practitioner.

The value of deductions from observations made will depend upon the knowledge possessed by and the analytical faculty of the individual. We may be led to make false deductions from observed facts because our faculty for critical observation has not been well developed. Our training may not have developed in us the ability to obtain and record a concise and complete summary of the facts available to a more accurate observer.

To secure an exact history in any case is the most important step in arriving at a correct opinion or diagnosis. The examiner, in his search for truth, will contrive to ask the same question in different ways. To listen patiently is the beginning of wisdom. However, we should be careful not to be misled by any inaccuracy of the patient's observation of his or her symptoms.

SUMMARY

The means employed in diagnosis should embrace all tried and proved methods of investigation in addition to a well developed faculty for clinical observation and analysis. If our studies are to be of the greatest value, we must aim to establish the worth of observed and established facts. Such evidence should be accepted as worth while only when we know that it is based upon the highest standard of proof. It should be our aim to develop balanced judgment which is bred from a healthy scepticism, broad-minded enough to be tolerant of things not clearly understood, combined with a desire for proof and an appreciation of the meaning of exact evidence.

Milk Control Regulations in Ontario, 1936

A. E. BERRY, M.A.Sc., C.E., Ph.D.
Director, Division of Sanitary Engineering, Department of Health of Ontario, Toronto

IN 1934 the responsibility for control of milk and products of milk other than butter and cheese was placed in the Milk Control Board. In accordance with the Milk Control Act, which authorized the Milk Control Board, the Board possessed wide powers relating to the production, transportation, processing, distribution, and sale of milk. It required that every milk distributor obtain a licence from the Board after submitting satisfactory evidence of experience, financial responsibility, and equipment to permit of the proper conduct of milk distribution. Under the Act the Board is authorized to promulgate regulations and these regulations, when duly published, have the force of law. During the two years following the appointment of the Board attention was given particularly to the licensing of distributors and the economic aspects of milk distribution.

Regulations relating to pasteurization plants and to milk plants handling raw milk, as well as further details concerning licensing, have just been published. As it is believed that these regulations are of specific interest to all who are concerned with the public health aspects of milk control in other provinces of Canada as well as in Ontario, the more important sections have been abstracted and presented in this review.

The Milk Control Board of Ontario is responsible to the Department of Agriculture in regard to Part I dealing with licences and Part II, Orders, Agreements and Returns. It functions with the Department of health in regard to Part III relating to pasteurization and Part IV, Milk Plants.

The following definitions are of interest:

Milk Plant—"Milk plant" shall include every plant in which milk is produced or handled except a pasteurization plant, and every building, machine, apparatus, equipment and appurtenance employed in or necessary for the heating, storing, cooling, processing, packaging or other handling of milk and forming part of or connected with such plant.

Pasteurization—"Pasteurization" shall mean the process of heating every particle of milk to a temperature of not less than 143 degrees Fahrenheit, of holding it at such temperature for not less than 30 minutes, and of cooling it immediately thereafter to 50 degrees Fahrenheit or lower in a manner and with equipment and apparatus approved by the Department of Health, and every term of like import shall have a corresponding meaning.

Pasteurization Plant—"Pasteurization plant" shall include every plant in which milk is pasteurized and every building, machine, apparatus, equipment and appurtenance employed in or necessary for the pasteurization, heating, storing, cooling, processing, packaging or in any way handling milk in such plant, and forming part of or connected with such plant, provided that where milk is pasteurized in any part of a plant the entire plant shall be deemed to be a pasteurization plant.

The definition of a milk plant as a plant handling raw milk is very broad and should be successful in bringing under supervision every plant. Likewise "pasteurization plant" is defined in such a way that no confusion can arise. Of special interest is the definition of pasteurization, in which the temperature required is stated as "not less than 143 degrees Fahrenheit", with a minimum holding period of thirty minutes.

PARTS I AND II

These parts of the regulations relate primarily to licensing and to orders, agreements, and returns as required by the Board. As these sections have already been in force and as they do not relate to the public health aspects of milk control, no further reference is made in this survey.

PART III: PASTEURIZATION PLANTS

As previously mentioned, the term "pasteurization plant" is clearly defined in the regulations. Of essential importance is section 15 which states:

> Every pasteurization plant, every pasteurization, and every operation connected with the handling of milk shall be subject to the inspection and approval of the Department.

This is supplemented by the succeeding section (16):

> No person shall use any word or term stating or indicating, either verbally or in writing, that such milk is pasteurized unless such milk has been pasteurized and handled in a pasteurization plant in accordance with the provisions of these regulations.

In establishing a plant or undertaking alterations or reconstruction, approval of the Board must be obtained and the applicant must furnish the Board with a copy of the plans and specifications together with such other material and information as the Board may require. This regulation is similar to that which has proved to be most valuable in the control of municipal water plants.

In considering the location and construction of pasteurization plants the regulations specify the selection of a suitable site free from any objectionable conditions and deal with such matters as screening of doors, windows and other openings; proper lighting and ventilation; floors, walls and ceilings; and proper drainage. It is required that separate rooms shall be provided in every pasteurization plant for (a) pasteurization, cooling and bottling operations; and (b) washing and bactericidal treatment of containers and miscellaneous equipment. Cans of unpasteurized milk shall not be loaded directly into or stored in the pasteurizing room. Self-closing doors as far as possible shall be provided on the pasteurizing room. Such doors shall not open directly into any stable, garage, or living quarters. Cleaned utensils and containers shall be stored in a room or compartment which is kept free from flies, dust, odours and other contamination. The essential facilities for the health and cleanliness of employees are set forth in section 24. Adequate and satisfactory water and drainage facilities shall be provided and all wastes and drainage from the

operation of the plant shall be disposed of in a satisfactory manner. Stables shall not be erected or maintained in such proximity as to affect adversely the process, and all manure and garbage shall be treated with a fly larvicide during the fly season.

Section 27 requires that equipment and containers used in the handling, processing, or storage of milk shall be so constructed and kept in repair as to facilitate cleaning and bactericidal treatment. It is required that every pasteurization plant shall have equipment of sufficient capacity for the maximum output of the plant.

As section 29 relates to the essential construction of the pasteurization connections, the entire section is quoted:

(a) Every valve and pipe line used in inlet and outlet connections on pasteurizers or holders shall be of metal not affected by milk to the extent of corroding or pitting the material, and shall not affect the flavour of milk by electrolysis or by other means;

(b) Every surface in contact with the milk shall be smooth and free from pits, crevices, cracks, open seams or threads;

(c) Passages shall be constructed to prevent pocketing;

(d) Every part shall be readily disassembled for cleaning;

(e) Every inlet valve shall be of the leak-protector type and every inlet valve and connection shall be so constructed and located as to prevent leakage or short circuiting of unpasteurized milk into the pasteurized, or into a pasteurizer or holder other than that being filled;

(f) Every groove on an inlet valve for diverting leakage shall be of ample dimensions and so arranged to permit free drainage;

(g) Every pipe line between any inlet valve and pasteurizer or holder shall be as short as possible and shall be sloped or otherwise arranged to drain freely;

(h) Every outlet valve shall be of the leak-protector type and shall have the valve seat either flush with the inner wall of the pasteurizer or so closely coupled that all milk in the valve pocket is within the influence of the agitation created by the stirring equipment;

(i) Every outlet valve shall prevent leakage past the valve seat into the milk outlet and grooves for diverting leakage shall be of ample dimensions and so arranged to permit free drainage;

(j) Sterilizing connections shall be provided where the construction of the outlet valve makes this necessary and they shall be non-clogging and shall not terminate in a channel through which milk is flowing.

(k) Valves shall be provided with necessary stops and guides to insure proper operation.

Provision is made in section 30 to ensure that piping and connections are of such size and material that they may be readily cleaned. It is required that the length of piping be a minimum and that no piping, pumps or equipment shall be used for both pasteurized and unpasteurized milk.

It is required that indicating and recording thermometers of satisfactory type shall be installed and used on each holder in which the holding time is not automatically controlled and in both inlet and outlet manifolds of vat, pocket or continuous flow installations. In the latter the milk is brought to the final pasteurization temperature before entering the holder and the time in which it is held in the holder is automatically controlled. This regulation is an important safeguard in proper pasteurizing of milk. The specifications for satisfactory thermometers and charts are presented.

The type of equipment used in milk processing shall preclude as far as possible the formation of foam in pasteurizers or holders and where foam collects in milk holders means shall be employed to keep the atmosphere above the milk at a temperature at least 5 degrees Fahrenheit higher than the pasteurizing temperature. No milk filters other than metal screens shall be placed on the outlet side of the pasteurizer or be used on milk after pasteurization.

In accordance with the definition of pasteurization, the milk after heating shall be cooled immediately to 50 degrees Fahrenheit or lower in a manner and with equipment and apparatus approved by the Department of Health. Section 34 provides the necessary regulations:

(1) Milk cooling equipment shall be provided of sufficient capacity and type to cool the milk from each pasteurizer or holding vat in a period not exceeding one and one-half hours.

(2) The temperature of the pasteurized milk shall not be reduced to lower than 120 degrees Fahrenheit before passing through the cooling equipment.

(3) The milk shall be cooled to 50 degrees Fahrenheit or lower and held at or below this temperature until delivery.

(4) Surface coolers shall be built of suitable material and so constructed as to afford ready access for cleaning, and provision shall be made to prevent water or condensation coming in contact with the milk or the cooling surfaces.

(5) Any open surface coolers shall be either located in separate, well-ventilated rooms, free from flies, dust, drip, splash, manual contact and other sources of contamination, or provided with tight-fitting covers or shields, and such covers or shields shall be so arranged as to afford ready access for cleaning the cooler.

(6) Regenerative heater-coolers shall be so constructed and maintained as to prevent access of the unpasteurized milk into the pasteurized milk.

(7) Solder shall not be used on the metal separating the pasteurized milk from the unpasteurized milk.

Detailed regulations are provided concerning the bottling and capping processes. The bottling must be done in mechanical equipment which can be readily cleaned and which does not expose the milk to contamination during the operation. Further, the equipment and the operation shall be such that a uniform mixture of the milk is added to each bottle. No unpasteurized milk shall be bottled or come in direct contact with bottling equipment used for pasteurized milk. Finally, bottles must be capped by mechanical equipment and hand capping is not permitted.

Supplementing the regulations regarding pasteurizing equipment are sections 39 to 47. Sections 39 and 40 are of major importance, relating specifically to the pasteurizing temperature. They are as follows:

(1) The operation of the pasteurizer or holding vat shall be such that the variation in temperature between the hottest and coldest sections of the milk shall not exceed one degree Fahrenheit.

(2) The temperature of the milk in the pasteurizer at any time shall be taken as that shown on the indicating thermometer rather than the recorder.

(3) The temperature shown by the recording thermometer shall be checked daily by the operator against the indicating thermometer and shall be adjusted to read at no time higher than the indicating thermometer.

(4) The bulbs of the thermometers shall be placed as close together as practicable and at the point of lowest temperature in the pasteurizer or holder.

(1) No recording chart shall be used for a period which will interfere with the clarity of the record or which will permit overlapping of graphs.

(2) The person in charge of the recorder shall sign every chart and shall see that the following information is recorded thereon:

(a) The date of each operation of the pasteurizer or holder;

(b) The number of the pasteurizer or holder, if more than one is in use, to which the recorder was attached;

(c) A recording of the indicating thermometer at some time corresponding with a marked point in the holding period.

(3) Where more than one recording thermometer is in use, the chart shall be numbered in such a manner as to indicate the recording thermometer which was used for such chart.

(4) The operator shall keep every chart for a period of three months after the date thereof.

It is required that the cover of the pasteurizer shall be kept closed during the holding period and until the milk is removed. Section 42 permits milk which has been contaminated subsequent to pasteurization to be repasteurized, but milk which has come into contact with contaminated machinery or has overflown from operations shall not be used for domestic consumption. Further, if any milk accidentally passes through equipment without proper treatment such equipment shall be sterilized before it is used again. Any equipment used for pasteurization and subsequent handling of milk shall be given a bactericidal treatment by steam or hot water when assembled immediately prior to the day's operations. Every valve shall be thoroughly steamed before being used. No piping, pumps or equipment with which pasteurized milk comes into contact shall be used in the handling of unpasteurized milk or other contaminated material, nor shall any connection be permitted between unpasteurized and pasteurized milk. Every valve and pipe connection to or from a pasteurizer or holder shall be disconnected during the holding period and when not in actual use. Milk which is likely to be held for more than two hours in the plant before pasteurization shall be cooled to 50 degrees Fahrenheit or lower on arrival and shall be held at such temperature until pasteurization begins.

Regulations 46 and 47 are important safeguards. These sections provide that no unpasteurized milk shall be bottled in any pasteurization plant or placed in containers for delivery to consumers. No products other than milk products and products of which milk is a substantial component shall be handled or processed in a pasteurization plant unless equipment entirely separate from equipment used in pasteurization is used and the handling or processing is carried on in a separate room. This latter regulation has been introduced in view of the recent practice of the distribution by dairies of products other than milk, such as fruit juices and similar beverages.

In regard to delivery, section 53 is important. It requires that all milk except that sold in wholesale quantities shall be delivered in glass bottles or other containers satisfactory to the Department and that every such container shall be labelled with the word "pasteurized" and the name of the operator.

After presenting in detail the requirements for pasteurizing plants and the pasteurization process, section 55 provides that every pasteurization and

process operation shall be under the direct supervision of a person having an adequate knowledge of such operations. This section is a very necessary one. The value of having only experienced and thoroughly trained operators of pasteurizing plants is recognized but such licensing has not yet been planned. The health of those handling milk is a matter of real concern and the following section (56) presents the responsibilities of the individual and of the medical officer of health:

(1) Every person whose work brings him into contact with the pasteurizing, processing or handling of milk, or the handling of containers or equipment, shall be free from, and shall not be a carrier of, any disease which may be spread through the medium of milk.

(2) Every such person shall satisfy the medical officer of health of the municipality of which the milk is sold or delivered as to his freedom from such diseases, and shall submit to such examinations and tests as the medical officer of health or the Department may require.

(3) When any operator believes or suspects that any employee is suffering from any such disease the operator shall forthwith notify the medical officer of health of the municipality in which the milk is sold or delivered.

(4) Upon evidence satisfactory to the Board that any such person has failed to satisfy any of the requirements of this section, the Board may direct the operator of the plant in which such person is employed to see that such person is not employed in any work which may bring him into contact with the pasteurizing, processing or handling of milk or the handling of containers or equipment, and every such operator shall carry out the direction of the Board.

PART IV: MILK PLANTS (RAW MILK DAIRIES)

Every milk plant and every operation connected with the handling of milk shall be subject to the inspection and approval of the Department. No person shall sell, offer for sale or deliver any milk until the milk plant in which such milk is handled or processed has been approved by the Department. Regulations similar to those relating to pasteurizing plants in regard to location, condition of buildings, water supplies, screening of windows and doors, lighting and ventilation, etc., are presented. It is required that separate rooms shall be provided in every milk plant for the bottling, cooling and handling of milk and for the washing and bactericidal treatment of containers and miscellaneous equipment. Milk plants handling raw milk shall have proper sanitary facilities for the employees.

The regulations require that every milk plant shall be provided with and shall use the following equipment: (a) sanitary bottling and capping equipment; (b) adequate milk cooling facilities; (c) cold storage facilities; (d) cleaning equipment for washing bottles, containers and miscellaneous equipment; (e) water heating equipment; and (f) thermometers and other equipment necessary for milk processing.

It is required that all unpasteurized milk sold, offered for sale or delivered shall be placed in bottles or other containers satisfactory to the Department. Bottling and capping shall be done by approved mechanical equipment. In reference to the cooling of milk, it is required that all milk shall be cooled to 50 degrees Fahrenheit or lower within two hours after milking and shall be

kept at such temperature until delivered to the consumer. It is necessary therefore that every milk plant and every building in which milk intended for sale is kept shall have facilities for the rapid cooling of milk to this temperature and such facilities shall be easily cleaned and protected against flies, dust and other contamination. The same provision is made prohibiting the handling in the milk plant of products other than milk or products of which milk is a substantial component except where completely separate equipment is used and where the processing is carried on in a separate room. All milk except that sold in wholesale quantities shall be delivered in glass bottles or in other containers satisfactory to the Department and every container shall be labelled with the words "raw milk" and the name of the operator. In reference to the health of those handling milk, the same regulations apply as to those employed in pasteurizing plants.

These regulations are now effective in Ontario and place upon the Milk Control Board, through the Department of Health, the responsibilities as defined. The duties will be performed by the Division of Sanitary Engineering.

Public Health is Dependent on Co-operation

AS public health advances, and it must advance, the professional public health activities cannot be effective unless they are co-ordinated with, and supplemented by, the services of the physician, the hospital, the nurse, and the social worker. The physician is as necessary to the public health as is the health officer and the sanitary engineer. The work of the private nurse and the visiting nurse is as necessary as that of the public health nurse. The hospital and its out-patient department are as necessary as the health department itself. The welfare agency, with its trained workers, performs an equally important part in this mass attack upon unnecessary mortality and morbidity. We are realizing that conflicts among those who are charged with the responsibility of preventing ill-health and its consequences are both futile and wrong. There are definite indications that practical and sound methods of co-operation are being developed.—Albert G. Milbank in *The Next Steps in Public Health* (proceedings of the 14th annual conference of the Milbank Memorial Fund, New York, 1936), p. 70.

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TUBERCULOSIS AND THE MEDICAL OFFICER OF HEALTH

WHAT is expected to-day of the medical officer of health in the efforts to reduce the incidence of tuberculosis and its toll of deaths in his community? An answer is clearly given in the presidential address of Dr. A. E. Ranney delivered to the Ontario Health Officers' Association at its last annual meeting and in the paper presented at the same meeting by Dr. G. C. Brink, Director of the Division of Tuberculosis Prevention in Ontario, both of which articles appear in this issue. These articles deserve the attention of every health officer. It is not expected that health officers are to be clinical experts in tuberculosis but it is reasonable to expect that every medical officer of health should be able to advise a family physician in the finding of all known contacts and the arranging for their proper examination and supervision. It is surely to be expected that the medical officer of health will, in conformity with the regulations of the Public Health Act, maintain proper records of all cases and contacts. The introduction of a convenient form for the use of physicians in Ontario in reporting tuberculosis and the supplying of an adequate record card for filing in the health department offices should be of real service in that province.

In surveying the results of the work of the travelling diagnostic clinics, Dr. Brink points out that of the 224 cases requiring sanatorium treatment not more than 50 per cent had been placed in sanatoria although a year had elapsed. This finding reveals a situation which is most distressing. Of what value, therefore, was the effort and expense entailed in the work of the diagnostic clinics to these 100 or more cases which needed sanatorium treatment but did not receive it? Who was at fault? Some patients probably refused to take treatment but such refusals may have been associated with failure to explain properly the need for treatment. In a number of instances the fault did not lie with the patient but with the medical officer of health, the practising physician, or the municipality. Tuberculosis will be reduced in proportion to the effectiveness of the control measures and effectiveness is dependent on co-operation among all concerned.

PROGRESS IN SECURING ADEQUATE MILK CONTROL

SOME progress in securing adequate control of the milk sold for human consumption is to be found in the recent reports of those officially concerned with this protective public health problem in the various provinces. There is evidence of a greater willingness on the part of provincial authorities to exercise their legislative prerogatives on behalf of the milk consumer. This implies increased public interest. The one is a corollary of the other. The regulations brought down in Ontario are not only a manifestation of the previously mentioned official concern but an excellent example of joint effort by two branches of government in the public good.

The need for official control of all milk sold is due either to individual or community ignorance, carelessness or greed. Purity is the primary requisite in milk. Cheap milk is like any other low-priced commodity; it lacks some of the attributes of the higher priced article. Whole milk which lacks any of its essential qualities, whether it be purity or nutritional value, is in final analysis expensive milk.

It would appear to be the opinion of all those engaged in the field of milk control in this country that some practicable form of licensing both producer and distributor is the most effective method of ensuring the co-operation of those engaged in the sale of this much-used article of food. The failure of the vendor to meet the reasonable requirements set by the provincial or municipal authorities should result in his loss of the privilege to sell his milk directly or indirectly to the public.

In almost all the provinces to-day some form of licensing is in force. The licensing of those concerned in the operation of dairy plants, with the setting of qualifications ensuring a reasonable knowledge of their responsibilities, is needed. Surely it is as reasonable to expect that the operator of a pasteurizing plant should give evidence of an adequate knowledge of the processing which he is called upon to control as it is to require a certificate of competency of all operators of stationary boilers or even drivers of motor cars. Public safety is the primary consideration. There are, of course, many difficulties to be met before a practical system of licensing operators can be effectively introduced.

The new regulations in Ontario take cognisance of the distribution by certain dairies of products other than milk or having a substantial milk basis, such, for example, as the distribution of fruit juices, safeguarding the proper handling of milk by limiting the use of equipment solely for milk or cream and requiring that the processing of fruit juices or other product be conducted in a separate section of the plant. The effort to inveigle the dairyman into the soft-drink business, under the guise of serving a public need by retailing prepared orange juice, as well as the increasing practice of reinforcing the original vitamin content of milk by irradiation or the addition of cod liver oil or its derivatives, has aroused those responsble for the protection of public milk supplies to the need for constant alertness.

The Canadian Public Health Association believes that pasteurization affords the only method for the rendering of milk safe for human consumption. The

distribution of raw milk is a public menace. The Association has never ceased to reiterate this conviction but it has laid emphasis also on the necessity for the application of those measures which make possible the production of clean milk. Education of the producers and the continuous, thorough supervision by competent inspectors employed by local municipalities are essential. The new regulations issued by the Milk Control Board in Ontario with the co-operation of the Department of Health will permit of a further advance towards the objective of the distribution of only *safe* milk.

STAPHYLOCOCCAL FOOD POISONING

IN the few years which have elapsed since information concerning the nature of the toxic products elaborated by strains of staphylococci was made available through the researches of Burnet, Dolman, and others, a number of outbreaks of staphylococcal food poisoning have been recorded. There are two definite and unrelated types of staphylococcal toxin. The one is characterized by properties study of which has resulted in making available an antitoxin of value in the clinical treatment of acute staphylococcus infection and staphylococcus toxoid for active immunization. By virtue of the adoption in 1934 of an international unit of staphylococcus antitoxin by the League of Nations, this phase of the staphylococcus problem has been firmly established. However, the properties of the toxin producing symptoms of food poisoning and called "enterotoxin" have not been widely explored. Strains of staphylococcus may produce the one type of toxin and not the other. The difficulties of incriminating beyond peradventure any given strain of staphylococcus as being responsible for a particular outbreak of food poisoning are great. Not only is it necessary to isolate the strain in pure culture but to determine the nature of the toxic filtrate derived therefrom. Heretofore the presence of enterotoxin has been demonstrated, in the main, by trial in human volunteers and monkeys.

The development of what promises to be a most satisfactory test for the presence of enterotoxin, using the kitten as the test animal, is a major contribution not only to the further study of this toxic product of staphylococcal growth but in epidemiological practice, permitting of the definite finding in many cases of poisoning which in the past have been vaguely assigned to the presence of some member of the Salmonella group. The publication of this new method of detecting staphylococcus enterotoxin will be received with great interest.

REPORTS FROM THE ANNUAL MEETING*

Part V

REPORTS OF THE COMMITTEES OF THE LABORATORY SECTION

1. The Committee on Standard Methods

THE Committee on Standard Methods, with its several sub-committees, presented a progress report at the Christmas meeting of the Laboratory Section. Consideration has been given to the question of the preparation of separate Canadian standard methods for water and sewage and for milk and dairy products. It was the feeling of the Committee, however, that the revised eighth edition of "Standard Methods for the Examination of Water and Sewage" as published by the American Public Health Association and the American Water Works Association, which will be available by the end of May, 1936, and which will contain a number of changes in bacteriological technique and in the chemical and microscopic methods, will render unnecessary the preparation of separate Canadian standard methods. It was felt also that certain optional methods might be designated later. A statement in regard to these optional methods would necessarily be deferred until the new edition of "Standard Methods" was available.

In reference to standard methods for milk and dairy products, the Laboratory Section had the pleasure of hearing from Dr. Robert S. Breed, Chairman of the American Public Health Association's Committee on Standard Methods for the Examination of Dairy and Other Food Products, concerning the work of that committee, particularly in regard to laboratory methods relating to milk. It is understood that a new edition of the American Public Health Association's "Standard Methods of Milk Analysis" will be published next year under the title "Standard Methods for the Examination of Dairy Products", since the next report is to include methods for the examination of ice cream and butter as well as for milk.

Following the progress report, the Laboratory Section adopted the following resolutions:

1. That the Laboratory Section endorses the recommendation of the Committee on Standard Methods that the existing standard methods for the examination of water and sewage and for milk and dairy products as defined by the American Public Health Association be temporarily adopted as official standards by the Canadian Public Health Association.

2. That on the publication of the eighth edition of the "Standard Methods" of the American Public Health Association as relating to water and sewage the Committee on Standard Methods of this Section make such recommendations regarding optional methods as they may feel are desirable.

**Presented at the Twenty-fifth Annual Meeting of the Canadian Public Health Association, Vancouver, B.C., June, 1936.*

The eighth edition, together with the recommended alternate methods, will, when approved by the Association, constitute the standard methods of this Association.

In connection with the organization of the sub-committee, I desire to report that Dr. D. T. Fraser has recommended that Dr. Ambrose Moffat replace him as Chairman of the Committee on Milk Methods.

N. J. HOWARD, *Chairman.*

2. THE SUB-COMMITTEE ON CHEMICAL METHODS OF WATER ANALYSIS

SINCE our report of last May, this Sub-committee has held three meetings and in addition there have been discussions and correspondence between the members in an endeavour to reach a definite conclusion concerning the creation of a set of chemical methods for water analysis which could be adopted as official in Canada, and also the advisability of including in such official methods a uniform means of reporting water analysis.

The Sub-committee recognizes that it is highly desirable to have a set of chemical methods for the analysis of water, sewage, and trade wastes which would be considered official in Canada. It does not believe, however, that it would be feasible at present to create an organization in Canada which would be successful in itself in accomplishing this work. It is therefore recommended that an enquiry be made as to the possibility of actively co-operating with the American Public Health Association and the American Water Works Association, who have jointly issued standard methods for the examination of water and sewage. It is also deemed important that there should be included in such a set of standard methods of analysis a uniform procedure of reporting analytical results with definitions of such terms as hardness, etc.

In connection with the organization of the Committee responsible for the publication of standard methods for the examination of water and sewage by the American Public Health Association and the American Water Works Association, an Advisory Committee has rendered valuable service. It consists of members of these two associations, the American Chemical Society, the American Medical Association, and the Association of Agricultural Chemists, etc., with representatives of the United States Government from the departments of Agriculture, Commerce, Industry, War and Navy, and from the United States Public Health Service. In addition there are representatives from universities and industrial and consulting organizations, numbering twenty.

Informal discussions of the possible relationships of the Sub-committee on Chemical Methods of Water Analysis, as well as of the Sub-committee on Bacteriological Methods, will be held by the members of the Committee in Canada who are also members of the American Public Health Association's Committee in the United States. When it is learned what plan of co-operation is possible, formal steps will be taken.

During the year the Sub-committee extended invitations to Dr. H. W. Hill

of British Columbia and to Messrs. M. H. McCrady and James Meadows of Quebec to become members. The National Research Council, Ottawa, has also been invited to be represented on this Sub-committee and it is a pleasure to record that Messrs. F. G. Green and A. F. Gill have been nominated by the President of the Council.

Following the receipt of the eighth edition of "Standard Methods for the Examination of Water and Sewage", copies of which will be available shortly, your Sub-committee will review the chemical methods and will be prepared to report on their adoption, together with any alternative methods that may be found necessary.

A. R. BONHAM (*Chairman*), A. V. DELAPORTE, H. A. LEVERIN, M. H. MCCRADY, and W. E. PATTERSON, joint committee representing the Canadian Public Health Association and the Canadian Institute of Chemistry.

3. THE COMMITTEE ON PUBLICATIONS

DURING the year 1935 fifteen papers were reviewed by the Committee and returned to the Editorial Board with a summary of the Committee recommendations. Eleven of these papers have already received publication in the Journal of the Association, three have been accepted for publication and one is being revised by the author.

The Editorial Board has continued to deal very generously with the Laboratory Section, having published fourteen papers on laboratory subjects during the last calendar year. Eight of these papers appeared as leading articles while six were published in the Laboratory Section of the Journal.

The prestige of the Association is to a considerable extent determined by the quality of the articles published in its official organ, the Journal. Many excellent papers are presented before each meeting of the Laboratory Section but it happens, not infrequently, that very desirable papers are lost to the Journal through the desire of the author to publish elsewhere. I believe that the privilege of presenting a paper before any section of the Association should automatically confer upon the Association priority rights for publication.

Most of the papers submitted for publication require careful editing and it would facilitate the work of the Committee on Publications and the Editorial Board if the author would observe certain fundamental principles in the preparation of his manuscript. As an example I quote three rather outstanding principles which are sometimes neglected:

1. The original, rather than a carbon copy, should be submitted.
2. Typewritten manuscripts should be double-spaced.
3. Citations of literature should follow an approved system, preferably a bibliography with reference numbers at the end of the article and on a separate sheet of paper. In the case of a journal, references should be given in the following order: author(s), title of article, name of journal, year, volume

number, and page number; and in the case of a book: author(s), title, publisher and place of publication, year, and (if a specific reference) page number.

The following pertinent advice to contributors is offered with apologies to the Journal of the American Medical Association:

"If you've got a thought that's happy—
Boil it down.
Make it short and crisp, and snappy—
Boil it down.
When your brain its coin has minted,
Down the page your pen has sprinted,
If you want your effort printed,
Boil it down.
Take out every surplus letter—
Boil it down.
Fewer syllables the better—
Boil it down.
Make your meaning plain—express it,
So we'll know—not merely guess it,
Then, my friend, e'er you address it,
Boil it down.
Cut out all the extra trimmings—
Boil it down.
Skim it well—then skim the skimmings—
Boil it down.
When you're sure 'twould be a sin to
Cut another sentence in two,
Send it on, and we'll begin to—
Boil it down."

In conclusion I wish to express my appreciation to Dr. Defries, chairman of the Editorial Board, and to my colleagues on the committee, Dr. James Craigie and Dr. Wm. D. Hay, for their hearty co-operation.

A. J. SLACK, *Chairman.*

4. THE COMMITTEE ON THE DIRECTORY OF LABORATORY PERSONNEL

THE publication of the first directory of those engaged in bacteriology, pathology and public health chemistry was received with appreciation. It contained 200 names and its preparation involved a large amount of correspondence. At the request of the Christmas meeting of the Laboratory Section, the Committee proceeded with the revision of the directory. Letters were sent to all whose names appeared in the first directory and to an additional number. The result has been most gratifying and the second edition will contain the names of 230. In addition to its value to the Section, the directory is a real help to all who are conducting laboratory work, permitting of the sending of reprints of articles and the making of enquiries when desired.

J. H. ORR, *Chairman.*

5. THE COMMITTEE ON NEW LABORATORY PROCEDURES

THE publication of the first Bulletin of the Section presenting laboratory procedures for which there are no standard methods and which after thorough trial arranged through the Section are recommended for use, was made in December. Copies were distributed at the Christmas meeting of the Laboratory Section and subsequently mailed to all members of the Section. Extra copies were requested by several of the provincial departments of health and it was evident that the Bulletin serves a very useful purpose.

The publication included: Cultural Method for the Primary Isolation of *M. tuberculosis;* The Virulence Test for *Corynebacterium Diphtheriae;* Method of Drying Complement for Use in Serology; Typing of Pneumococcus using Neufeld Reaction; and Dark Field Examination of Chancre Fluid and Use of Combined Outfit.

The preparation of Bulletin No. 2 is already in progress and will be available for distribution in December. Included in this bulletin will be an outline of the complement fixation test as an aid in the diagnosis of smallpox. Through the Section a supply of sera for controls in the test has been made available and it is hoped that several laboratories will be able to report on the value of this method. Following the recommendations of the Section and the publication of the use of dried complement, a request has been made to the Connaught Laboratories, University of Toronto, to consider the preparation and furnishing of dried complement to laboratories.

G. D. W. CAMERON, *Chairman.*

6. THE COMMITTEE ON THE CLASSIFICATION OF SALMONELLA

THE appointment of this committee will make possible the collection and study of *Salmonella* strains as obtained in the various provincial, municipal, and hospital laboratories. The present unsatisfactory position of identification of various strains and the complexity of the present classification call for study.

The Committee consists of representatives of the provincial and municipal laboratories throughout Canada and the laboratory work will be done in the School of Hygiene, University of Toronto, through the co-operation of Dr. James Craigie, Dr. D. T. Fraser, and Dr. K. F. Brandon. In addition to these members, the following are also members of the Committee: Dr. R. A. H. Mackeen, Saint John; Dr. D. J. MacKenzie, Halifax; Mr. M. H. McCrady, Montreal; Dr. A. L. MacNabb, Toronto; Dr. F. T. Cadham, Winnipeg; Dr. Francis McGill, Regina; Dr. Allan Coats Rankin, Edmonton; and Dr. C. E. Dolman, Vancouver.

M. H. BROWN, *Chairman.*

7. THE COMMITTEE ON DIAGNOSTIC OUTFITS

AT the twenty-fourth annual meeting of the Canadian Public Health Association a report was submitted by the Committee on Diagnostic Outfits which showed the various outfits which are being used by the different laboratories throughout the Dominion of Canada.

The Committee has undertaken a further survey of these outfits and recommendations are now being submitted as to a suitable outfit for each type of specimen. Many of the most practical features of outfits which were reviewed have been incorporated, due regard being paid to the compactness, size, durability and cost of the outfits recommended. Parcel post regulations concerning the shipment of "specimens of diseased tissues" have also been taken into consideration.

Data sheets have been reviewed and an attempt has been made to recommend a type of data sheet for each outfit which will require only information essential to a diagnostic laboratory.

Prints of the recommended diagnostic outfits and data sheets with suitable directions for obtaining specimens are being sent to the directors of each of the provincial public health laboratories and to several municipal laboratories. It is hoped that the laboratories will co-operate by offering comments and criticisms of the outfits so that the most desirable set of diagnostic outfits may be determined.

J. S. KITCHING, *Secretary.* W. B. MCCLURE, *Chairman.*

GEORGE WHITMAN BAILEY, M.D., C.M.

DR. GEORGE WHITMAN BAILEY, Medical Inspector of Schools for the province of New Brunswick, died at his home in Fredericton on September 21, 1936, after a short illness.

Dr. Bailey, a son of the late Dr. Loring W. Bailey, F.R.C.S., was born in Fredericton and educated in Fredericton and Saint John. After receiving the degree of M.D., C.M. from McGill University in 1907 he practised medicine for many years at St. Martins and Fredericton Junction. When, in 1922, the Hon. Dr. William F. Roberts instituted a full-time medical inspection of schools service in New Brunswick, Dr. Bailey was among those selected to conduct this work. After completing a post-graduate course at McGill University he entered upon his duties and in the fourteen years of his service gave of his best to the thousands of children who came under his supervision. In addition to his professional duties, Dr. Bailey engaged in many other activities and took a keen interest in historical, geographical, and natural history subjects and in photography. He was a member of the Canadian Public Health Association for many years.

Dr. Bailey was known throughout New Brunswick as a most capable official and word of his death was received with sincere regret not only by his associates in public health, but by all those with whom he came in contact.

LETTER FROM GREAT BRITAIN

GEORGE F. BUCHAN, M.D., F.R.C.P., D.P.H.,
London

Conferences

THE Annual Meeting of the British Medical Association, the Conference of the National Association for the Prevention of Tuberculosis, the Maternity and Child Welfare Conference and the Health Congress of the Royal Sanitary Institute were all held in the month of July last. The Annual Meeting of the British Medical Association is confined to medical men and does not, therefore, make so wide an appeal as the other Conferences mentioned.

The Minister of Health, the Right Honourable Sir Kingsley Wood, M.P., opened the Conference of the National Association for the Prevention of Tuberculosis while the Deputy Minister of Health, Mr. Geoffrey Shakespeare, M.P., gave the inaugural address to the Health Congress of the Royal Sanitary Institute, deputizing for the Minister of Health.

These Conferences were interesting; all are important but the Health Congress is especially so as it is the one occasion throughout the year when members of local authorities and their principal medical officers confer together on health matters. This year at Southport the Congress of the Royal Sanitary Institute discussed many matters such as the future of the isolation hospital, the disposal of the dead, overcrowding, atmospheric pollution, public dental services, salaried midwives and child guidance. It would be impossible in a letter such as this to give an adequate idea of the material submitted at a Conference of this character at which some 2,000 representatives attended. The academic discussions in the morning were supplemented by visits of public health interest in the afternoon and social gatherings in the evening. It was a thoroughly enjoyable week at Southport and the luncheon given to Overseas Delegates by the Council of the Royal Sanitary Institute during the week was one of its principal features.

National Conference on Maternity and Child Welfare

This Conference was held this year in the city of Liverpool and the attendance was a record one. Practically every local authority in the country sent lay and medical delegates, the various voluntary bodies were widely represented, and many visitors came from the Dominions Overseas and from other countries. Free interchange of opinion and experience was thus possible between the various interests concerned. Liverpool has recently reorganized and extended her Child Welfare Schemes and delegates were given ample opportunity to study them. They were also given a warm civic welcome and much hospitality.

During the formal discussions it is the custom to direct attention to one problem or aspect of child welfare and on this occasion the subject was Maternal Health in Relation to Child Health.

Although as Mr. Geoffrey Shakespeare, M.P., Deputy Minister of Health, pointed out in his Presidential Address, motherhood is actually safer in this country than in any other with the exception of Holland, we are far from satisfied with our maternal mortality and morbidity rates, and the neo-natal death rate remains high and stationary compared with the general infant mortality rate. Is there a relationship between these two relative failures and if so how can maternal welfare be further promoted?

Professor Leyland Robinson of

Liverpool University drew attention to a factor which is widely enough known and comes under the universal law that we must all sacrifice to the next generation, but is not always kept in mind by the over optimistic, namely, that the interests of the mother and her unborn child are not always identical. She takes certain risks. It is our business to reduce them to the minimum and there was general agreement that in so doing we are also reducing mortality and morbidity in her offspring. Professor Robinson considered that modern preventive methods had not yet been adequately applied and urged among other things, universal and more thorough ante-natal supervision. better trained medical officers and midwives, hospital delivery for primipara and for multipara of 40 years and over, and above all more research into the causes of morbidity in mother and foetus.

Other speakers laid emphasis on social and environmental factors which militate against the health of the expectant and nursing mother and indirectly increase the risks of child bearing and the danger to life of the infant during its early months, and suggested that such things as freedom from anxiety and fear, physical rest—for which scarcely any provision is made for the working class mother—and adequate nourishment instead of bare subsistence might be as potent in saving the life and health of mother and child as the provision of high obstetrical skill and hospital beds.

PARLIAMENT

The Parliamentary Session which concluded at the end of July, 1936, has been notable for the large amount of time which has been given to public health measures. The Midwives Act 1936, the Public Health Act 1936, the Public Health (London) Act 1936 and the Housing Act, 1936—all Acts of major importance—have been passed.

In my last letter I gave some conception of the Midwives Act which is entirely new legislation. The other Acts mentioned above were passed more with the idea of simplifying and clarifying and consolidating existing law than with introducing any new matter. They are nevertheless highly important on this account and very welcome to the public health administrator who thus in future will have fewer Acts to which to refer in dealing with any particular subject.

CHILDREN UNDER FIVE

The infant mortality rate in England and Wales during 1935 was 57 per 1,000 births which is the lowest on record. Increasing attention is now being given to the child over one year of age. The Ministry of Health on the 29th May, 1936, issued a Circular in which the Minister exhorts local authorities to extend the attention which is given to children under one to children between one and five years. He states that more than 16 per cent of the children entering school at five years are found to require treatment for some disease or defect and that in many of these cases these conditions could have been prevented from developing or could have been quickly cured if adequate supervision of the health of the children had been exercised throughout the pre-school years. He considers it important that these children should in all districts receive health visits from duly appointed and accredited health visitors and should attend the health centres of the local authority in the same way as children under one year of age.

NURSERY SCHOOLS AND NURSERY CLASSES

The need for the care of children under five is further emphasized by the Board of Education in their Educational Pamphlet No. 106 relating to nursery schools and nursery classes. This pamphlet was issued in May, 1936. The pamphlet indicates

that the proper place for children under five years of age is the home but that while this is the ideal, it is certain that many homes to-day are not proper places for bringing up young children. There are undoubtedly children under five who need care and training and surroundings which for one reason or another and through no faults of their parents cannot be given them at home. Various kinds and degrees of public provision have been made for those young children who need it. There is the open air nursery school with the opportunities it offers of medical care and nurture, fresh air, good food, sleep and social training for ill-nourished or otherwise neglected children between the ages of two and five years. Then there is the nursery class which is usually a special class in an ordinary elementary school. But both the nursery school and the nursery class have a common aim, namely, the close co-operation between the home and the school in order that the child may obtain the greatest possible benefits, medically, educationally and socially at a critical period of life. Mothers who go out to work are very glad of nursery schools or nursery classes which may really be considered as places of guardianship where their children may remain all day and receive good food and sunlight and medical help as may be necessary.

The social conditions of the homes, modern housing conditions, the growth of traffic, and all kinds of present-day social and industrial and financial considerations have brought the whole subject of the care of the under five to the fore and made it necessary for the public authorities to examine the available services and how they can be used to the advantage of early child life and training.

FACTORY HYGIENE

The Annual Report of H.M. Chief Inspector of Factories and Workshops for 1935 reports great industrial activity during the year, especially in the Midlands and South. The output of steel constitutes a record and there was increased activity in the cotton industry where depression had come to be regarded as permanent.

An increase in the number of accidents was recorded, an excess of 9 per cent over those for 1934 and 32 per cent over those for 1933, doubtless accounted for by greater industrial activity. One factor in this increase in accidents is the accident proneness of workers in operations new to them or from which they have been absent for some time owing to unemployment. Progress has been made in special measures to prevent accidents amongst juvenile workers. There has been a substantial increase in accidents due to failure of numbers of employers and workmen to appreciate the fragility of asbestos roofing material. These accidents could probably have been avoided by suitably placed warnings and greater care.

The educational activities of the National "Safety First" Association of the Industrial Welfare Society and the Safety Organizations established by individual works have progressed, and nearly 90 per cent of the blast furnaces, iron and steel mills, heavy engineering, iron founding and ship building works now have Safety Committees.

The general health of workers does not appear to have suffered from the increased industrial activity. The increasing number of cases of tuberculosis of the lungs, which have been disclosed occurring in specific places of employment do not appear to be associated with the employment except in the case of glass blowing, where the blow pipe is passed rapidly between the mouth of the pupil and that of the skilled glass-blower.

The number of cases of lead poisoning which was 198 in 1934 fell to 168, the same as in 1933. The high incidence of severe epitheliomatous ulceration in certain industries has continued. Little improvement is to

be expected until periodical medical examination becomes more prevalent. The value of periodical medical examination is shown by the following figures. In one group of works employing 545 men, there were during the period under review 106 cases of pitch warts and pitch epitheliomata found at the six monthly medical examination, but only one case was fatal. In a similar works employing 800 men but with no periodical medical examination, only 51 cases were notified during the same period, but six of these were fatal.

An attempt is being made to correlate the electrical and medical features of electric shock, but definite conclusions cannot yet be drawn. A new industrial disease has arisen from Mansonia wood imported from Nigeria and used as a substitute for walnut. The dust from it sets up violent sneezing, cough, nausea, nose bleeding, sore-throat and weakness of the arms and legs. The use of the wood has been discontinued and a sample is being analyzed; it may reveal an alkaloid similar to that in African box wood.

The Chief Inspector concludes his introduction to the Report by welcoming the Bill that is before Parliament to revise and consolidate the law relating to the safety, health and welfare of factory workers.

ASSOCIATION NEWS

Laboratory Section

THE meeting of the Laboratory Section on the occasion of the annual meeting held in Vancouver in June was particularly successful. The program and arrangements were under the immediate direction of Dr. C. E. Dolman and Dr. R. J. Gibbons of Vancouver. The session was participated in by prominent laboratory workers on the Pacific coast, both in the United States and Canada. A series of demonstrations was a feature of the session.

A meeting of the Committee on Standard Methods of the Laboratory Section is being called to consider the adoption, as standard methods for Canada, of the Standard Methods for the Examination of Water and Sewage issued by the American Public Health Association and the American Water Works Association. Consideration will be given to the inclusion, for use in Canada, of any alternate methods which may be deemed advisable.

The Committee on Diagnostic Outfits is forwarding to laboratory directors a report of the committee's findings and recommendations concerning the most suitable forms of outfits for the collection of the various specimens forwarded by physicians for diagnostic purposes.

At the Christmas meeting of the Laboratory Section of the Association last year a special committee was appointed on the classification of the Salmonella group of enteric pathogens. This group of organisms includes all the known gram-negative, motile bacilli pathogenic for man, animals, or both. The appointment of this committee reflects the broadening interest in enteric disease in Canada and the need for study of the incidence and types of these Salmonella strains as obtained in the various provincial, municipal and hospital laboratories. The committee consists of representatives of the provincial and municipal departments and the laboratory work will be done in the School of Hygiene, University of Toronto. It is hoped that the diagnostic laboratories throughout the country will co-operate in submitting all available Salmonella strains isolated to Dr. K. F. Brandon, secretary of the committee. The present unsatisfactory position in regard to identification of strains and the complexity of the existing classification call for study, and there is great merit in the effort which

the Laboratory Section is to make through the work of this committee.

Announcement has been made of the holding of the fifth Christmas meeting of the Section on December 21st and 22nd in the Royal York Hotel, Toronto. Choice of these dates will meet with general approval as preference has been expressed for the holding of the meeting during the Christmas season. The meeting will open on Monday afternoon and two sessions are being arranged for Tuesday. The annual luncheon session will be also held on Tuesday. It has been decided this year to increase the number of papers presented, strictly limiting the presentations to 15 minutes. The committee has under consideration the publication of abstracts of all the papers presented, if possible, in the columns of this journal early in the new year. It is the belief of the Section Council that the Christmas meeting offers a suitable opportunity for the presentation of new work. Prompt publication of the abstracts, with the subsequent publication of certain of the articles in detail, will meet the need which has been felt by those who have contributed to the programs in past years. It is hoped also that a series of papers of interest to those in the field of dairy bacteriology will be presented.

Members of the Laboratory Section will be interested to learn of the following appointments: Mr. E. C. Beck, B.S.A., M.A., formerly of the Department of Botany, University of Toronto, has been appointed Professor of Bacteriology in the Ontario Agricultural College, Guelph, to fill the vacancy occasioned by the retirement of Professor Jones. Dr. A. E. Allin, B.A., D.P.H., has been appointed a member of the Department of Bacteriology, McGill University, under the direction of Professor E. G. D. Murray. Miss D. E. Kerr, of the Provincial Board of Health Laboratories, Vancouver, B.C., has been granted leave of absence for post-graduate study. Miss Kerr is engaged in such studies in the School of Hygiene, University of Toronto.

CERTIFICATION OF SANITARY INSPECTORS

THE second annual examinations for the certification of sanitary inspectors in Canada were held on September 23rd, 24th and 25th in five provincial centres. These included Vancouver, Edmonton, Toronto, Montreal, and Saint John. Applications were received from fifty candidates and of these forty-two were approved. All sanitary inspectors who have been employed in sanitary duties for at least one year are at present eligible for the examination. After January 1, 1938, all candidates must submit evidence of completing a satisfactory secondary school education. The majority of the candidates sitting for the examination this year are members of local departments of health. Candidates who have not served as sanitary inspectors for one year are required to make application six months prior to the holding of the examination, at which time they must submit evidence of their eligibility and of the proposed course of practical training which they plan to undertake. On the completion of an approved course of practical training in a department of health, a certificate from the administrative officer of the health department is required, recording his approval of the candidate's training. The number of such candidates making application this year indicates the interest of the departments of health in assisting in the training of new sanitary inspectors. A course of instruction was provided under the direction of Dr. J. W. McIntosh, D.P.H. in the Department of Health of Vancouver, and in Toronto provision was made for suitable training supplemented by lectures under the direction of Dr. Gordon P. Jackson, D.P.H., Medical Officer of Health, for inspectors in his department. A course of instruction is provided annually by Dr. A. J. Douglas in the city of Winnipeg.

Courses were also arranged by Dr. W. H. Hill, D.P.H., in Calgary and by Dr. Fred Adams, D.P.H., in Windsor.

The following are the examination papers in the three subjects, Sanitation, Food Control and Legislation, and Prevention and Control of Communicable Diseases and Related Subjects. Announcement of the examination returns will be made in the November issue of the Journal.

SANITATION

Time: 3 hours

Answer any FIVE *of the six questions.*

1. Discuss the essential features of a sanitary privy as to: (*a*) location, (*b*) construction, and (*c*) disposal of excreta.

2. State the type of material used and the purposes of the following parts of a plumbing system of a residence, illustrating by a sketch: (*a*) house drain, (*b*) fresh air vent, (*c*) soil pipe, and (*d*) trap on water closet.

3. What points would you note in investigating the ventilation in a crowded room? What changes take place in the composition of the air? How do you account for the feeling of discomfort experienced by the occupants?

4. Discuss wells as used for domestic water supplies under the following headings: (*a*) types, (*b*) location, (*c*) construction of each type, and (*d*) collection and examination of a sample of water.

5. Describe the construction and operation of a septic tank for a rural residence, illustrating by a sketch.

6. Write brief notes on: (*a*) nuisances according to the Public Health Act, (*b*) proper care and disposal of horse manure to prevent fly breeding, and (*c*) methods employed in testing drains.

FOOD CONTROL AND LEGISLATION

Time: 3 hours

Answer any FIVE *of the six questions.*

1. What diseases are spread by milk? Outline in detail the procedure which should be carried out in the production of milk, from the cow to the consumer, to ensure a safe milk supply.

2. Explain the following public health measures and name in each instance the diseases the incidence of which may be reduced thereby: (*a*) restaurant inspection, (*b*) meat inspection, and (*c*) supervision of ice supplies.

3. A complaint has been made regarding a small slaughter house, located on a stream near a town. What conditions would probably be found? As the owner is willing to rebuild, what specific recommendations would you make in regard to design, construction, and operation?

4. Discuss the work of the sanitary inspector in the community as a health instructor, giving examples.

5. Write notes on: (*a*) adulteration of food products, (*b*) food poisoning, and (*c*) supervision of the sale of fish and other sea food.

6. Differentiate the functions of the federal, provincial, and municipal health departments.

PREVENTION AND CONTROL OF COMMUNICABLE DISEASES AND RELATED SUBJECTS

Time: 3 hours

Answer any FIVE *of the six questions.*

1. An epidemic of typhoid fever occurs in a small city. What sources of infection must be investigated? What control measures would be necessary in each of the sources investigated?

2. "Communicable diseases are due to living agents." Discuss the significance of this statement in relation to (*a*) quarantine, (*b*) isolation, (*c*) disinfection, and (*d*) prevention by immunization.

3. What are your duties in regard to the conduct of quarantine following the notification of (*a*) smallpox in a lodging house, (*b*) scarlet fever in a dairy, and (*c*) diphtheria in a private home?

4. Write explanatory notes on: (*a*) microorganism, (*b*) concurrent disinfection, (*c*) infant mortality rate, (*d*) disease transmission by insects, and (*e*) immunity.

5. Discuss tuberculosis (all forms) under the following headings: (*a*) *cause,* (*b*) mode of transmission, and (*c*) prevention and control, with particular reference to the work of the sanitary inspector.

6. For what purposes are premises fumigated? What methods may be employed? What precautions must be taken to safeguard the procedures?

PLANS, PROGRAMS, AND PROGRESS

Metropolitan Health Board for Greater Vancouver

APPROVAL of the plan for a metropolitan health board for Greater Vancouver was given by the Vancouver city council on September 17th. The creation of the Greater Vancouver Health Board will amalgamate the health services of Vancouver, North Vancouver, Burnaby, Richmond, and the University Area, providing an adequate health program for each municipality.

Opening of the William Hallock Park Laboratory, New York Department of Health

THE opening of the new laboratories of the Department of Health of New York City on October 6th was the occasion for a further expression of appreciation of Dr. William H. Park by the officials of the city and state and by leading scientists from all parts of the continent. For many years Dr. Park had laboured to obtain adequate new laboratories to replace the limited quarters which the department had occupied on the grounds of the Willard Parker Hospital. Although Dr. Park reached the retirement age of seventy on December 20, 1933, having served as Director since the inception of the laboratories in 1894, his official connection with the laboratories was continued at the request of the city until the opening of the new laboratories. Dr. Park will continue to conduct researches in his own private laboratory in the new building. The new laboratories will be a memorial to the accomplishments of Dr. Park and of his associates.

Informing the Public Concerning Poliomyelitis

A FEATURE of the control program in Manitoba this year during the serious outbreak of poliomyelitis has been the supplying to the press of the essential information concerning the known facts of this disease, stressing particularly the information which would lead to the prompt calling of the physician by parents. The inclusion of a picture of a normal child bending forward, presenting a well-rounded curve of the back, in a short article descriptive of the early signs and symptoms of the disease has been most effective in emphasizing the recognition of early symptoms. The provision also made by certain of the affected municipalities to permit parents to call physicians without charge has been an important factor in furthering prompt treatment.

Appointment of Dr. S. C. Peterson

THE appointment has been announced by the Hon. Dr. G. M. Weir of Dr. S. C. Peterson as Director of Venereal Disease Control in British Columbia. Dr. Peterson was formerly Director of the Venereal Disease Clinic of the Department of Health and Public Welfare, Manitoba.

Poliomyelitis in Ontario

DURING September an outbreak of poliomyelitis occurred in Algoma, centering chiefly in Sault Ste. Marie. The disease has been reported in a number of cities in central Ontario. To October 3rd the total number of cases reported in the province this year was 112, of which 32 were in Sault Ste. Marie.. The incidence in Ontario in recent years is as folws: 1932, 175 cases; 1933, 53 cases; 1934, 326 cases; and 1935, 108 cases.

Appointment of Dr. A. Somerville, D.P.H., as Director of the Foothills Health Unit, Alta.

THE Foothills Health Unit, established in 1931 to provide health services for the area extending from Parkland to Turner Valley and from Vulcan to the foothills, with High

River as the headquarters, will be under the direction of Dr. A. Somerville, D.P.H., formerly of Ponoka.

During the past five years the work of the unit has been effectively organized and a larger measure of the financial responsibility assumed by the community. More than 60 per cent of the school children and 30 per cent of the pre-school children have received diphtheria toxoid and smallpox vaccine.

IMMUNIZATION OF PRE-SCHOOL CHILDREN IN OSHAWA, ONT.

RECOGNIZING that the time for conducting immunization against diphtheria, scarlet fever and smallpox is before the child enters school, the Department of Health of Oshawa, under the direction of Dr. T. W. G. McKay, again provided facilities for pre-school children during the summer months. In a recent report it is recorded that 506 children received preventive treatment, including 152 immunizations against diphtheria, 305 against scarlet fever, and 49 vaccinations against smallpox.

APPOINTMENT OF DR. A. HARDISTY SELLERS

THE appointment of A. Hardisty Sellers, B.A., M.D., D.P.H., to the staff of the Provincial Department of Health and Hospitals, Ontario, has been announced. He will concern himself with the gathering of such statistical data as are pertinent to the activities of the Department. Dr. Sellers, who has been a member of the Department of Epidemiology and Biometrics, School of Hygiene, University of Toronto, will continue his association with the School.

L'ASSOCIATION DES MEDECINS DE LANGUE FRANCAISE DE L'AMERIQUE DU NORD

AT the meeting of l'Association des Médecins de Langue Française de l'Amérique du Nord, which was held in Montreal from September 6th to 10th, a resolution was passed following the presentation of Dr. H. Geoffroy, of the Bruchesi Institute, urging the provincial government to adopt legislation that school teachers should receive a thorough medical examination upon assuming their duties and have regular periodic examinations thereafter.

PHYSICIANS ENROLLED AT THE SCHOOL OF HYGIENE, UNIVERSITY OF TORONTO

THE following physicians are enrolled for the course leading to the Diploma in Public Health at the School of Hygiene, University of Toronto: Dr. S. E. Ferreira, Jamaica, B.W.I.; Dr. I. K. Gilhuly, Rapid City, Man.; Dr. Richard Monahan, Saint John, N.B.; Dr. J. O. Roy, Becancourt, Que.; Dr. F. P. Sparks, Victoria, B.C.; Dr. C. J. Beckwith, Kentville, N.S.; Dr. M. S. Lougheed, Winnipeg, Man.; Dr. G. C. Leger, Buctouche, N.B.; Dr. Georges Smith, Nicolet, Que.; Dr. William Mosley, Toronto, Ont.; Dr. P. J. Losier, Chatham, N.B.; Dr. W. J. Wood, Great Falls, Man.; Dr. P. Poliquin, Amos, Que.; Dr. J. F. Leclerc, Quebec, Que.; Dr. D. H. Fryer, Bracebridge, Ont.; Dr. J. Howie, Montreal, Que.; and Dr. J. A. Langis, Yamachiche, Que.

ANNUAL MEETING, SASKATCHEWAN HEALTH OFFICIALS' ASSOCIATION

OWING to the death of R. H. Murray, C.E., Secretary-Treasurer of the Association and Director of the Division of Sanitation in the Department of Public Health of Saskatchewan, the annual meeting of the Saskatchewan Health Officials' Association, which was to have been held this fall, has been postponed. It is planned to hold the next meeting on Friday, June 4, 1937, in the Bessborough Hotel, Saskatoon. Dr. C. F. W. Hames, D.P.H., has been appointed Acting Secretary.

BOOKS AND REPORTS

Disease and Destiny. *Ralph H. Major, M.D. D. Appleton-Century Company, New York, 1936. Canadian agents, The Ryerson Press, Toronto. 338 pages. $4.00.*

"Disease and Destiny" is one of those books which one constantly seeks but seldom finds. Dr. Major possesses the rare ability to take a story of misery and pathos and transform it into one of historical as well as of medical interest. The quaint anecdotes coined from his broad knowledge of history contribute in no small measure to the appeal of the text.

The author discusses in turn the ravages of plague, typhus fever, tuberculosis, smallpox, diphtheria, malaria, leprosy, yellow fever, hemophilia, and "the worst plague of all", syphilis. Delving into the past he picks up the origin of each disease and traces its career to the present time.

The spotlight plays on such names as Kircher, "the father of the germ theory"; Ricketts, who gave his life in the search for the germ causing typhus fever; Koch, Jenner, Behring, Ross, Gorgas, and several other "modern martyrs of science who get but a passing thought."

The drastic role which disease has played in the moulding of the world's history leaves an impression in the reader's mind which will not easily be forgotten.

"Disease and Destiny" is by no means a textbook. Laymen, as well as those actively interested in the broad field of medicine, are strongly advised to read this attractive volume. Dr. Major is to be congratulated on his excellent contribution to the annals of medical history.

G. F. Surphlis

History of the Canadian Medical Association, 1867-1921. *H. E. MacDermot, M.D., F.R.C.P.(C.). The Canadian Medical Association, 184 College Street, Toronto, Ont., 1935. 209 pages. $3.00.*

Dr. H. E. MacDermot's literary skill has achieved singular sucess in the writing of this account of the evolution of the Canadian Medical Association. It is a highly interesting record of the progress of Canadian medicine—the gradual condensation and integration of local societies, the development of national spirit and the sublimation of local prejudice and self-interest to the broader concept of medical activity. These are landmarks of the changes which have been and still are taking place.

This historical volume is presented in two parts. The first of these presents the early history of medical practice in Canada and the attempts to form an association. Succeeding chapters are devoted to various periods in the life of the Association—the first twenty-five years, the period from 1894-1914, the Great War years, and subsequent developments. This vivid account of the inception and progress of the Canadian Medical Association is beautifully done. In later chapters in this part of the book early medical journals and medical societies are discussed briefly.

Part two contains the reports of committees at the first annual meeting of the Association, extracts from the original constitution, and the bill for the regulation of medical practice, 1870, as well as a list of original members and annual meetings to 1934.

A. H. Sellers